Dairy Situation

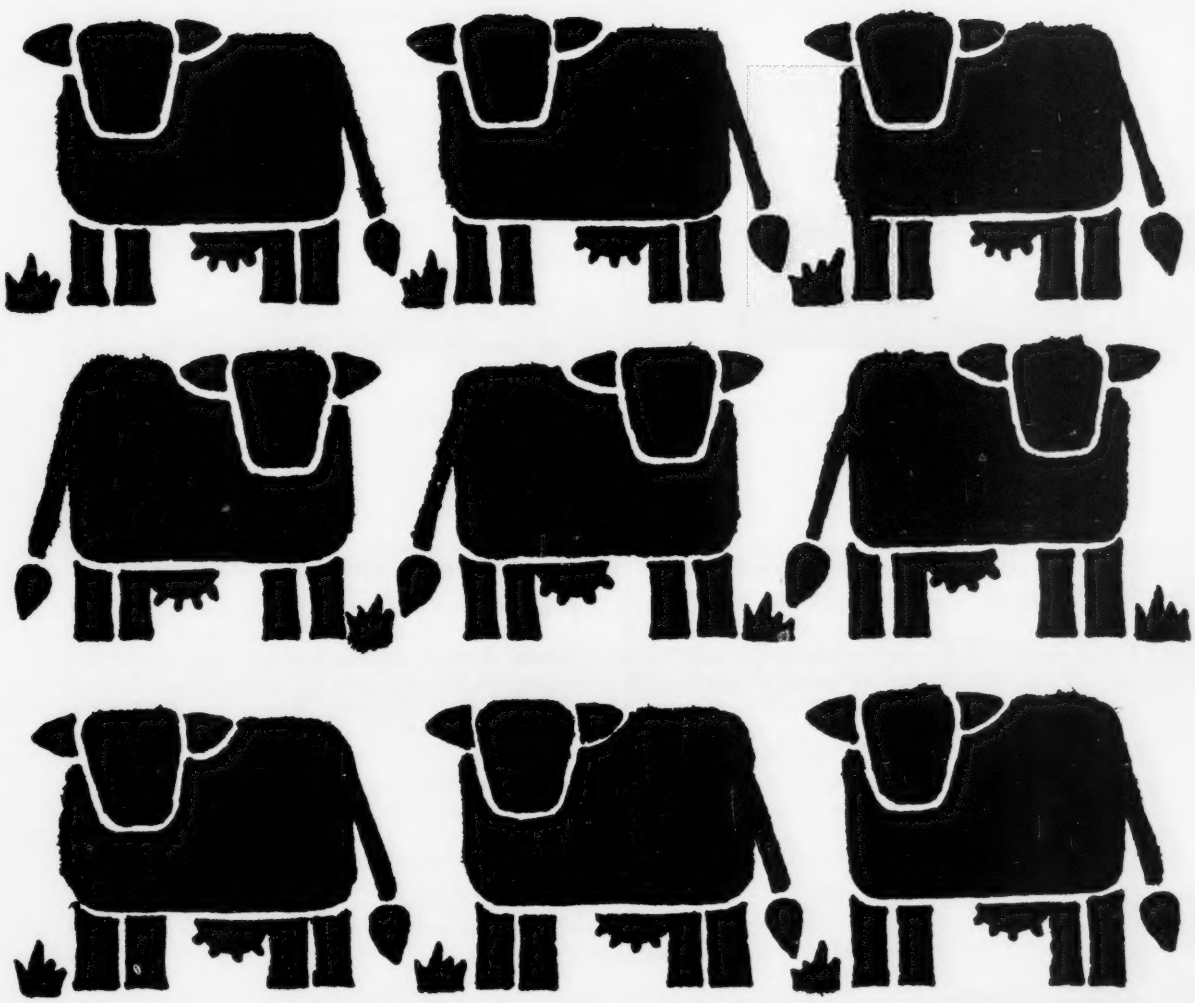
Economics, Statistics, and Cooperatives Service

DS-371

U.S. Department of Agriculture

JULY 1978

Approved by the World Food and Agricultural Outlook and Situation Board



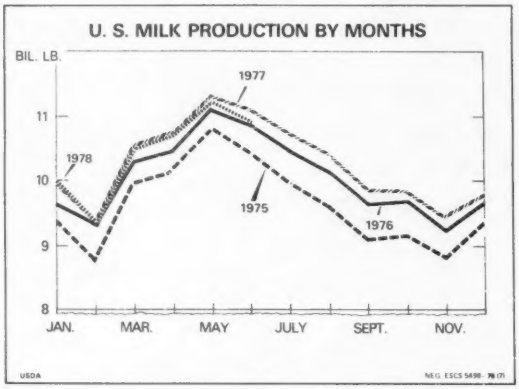


Figure 1

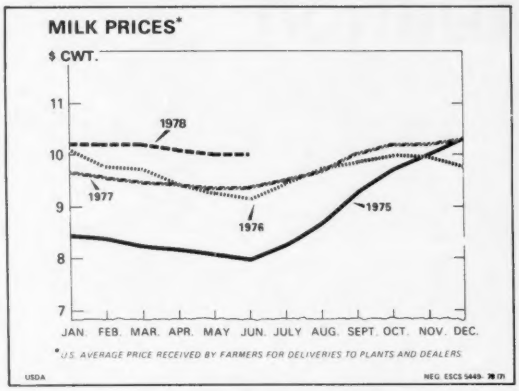


Figure 2

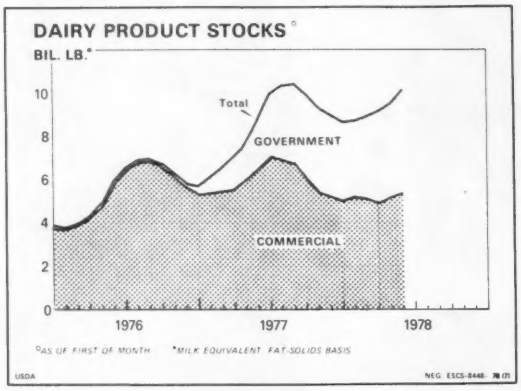


Figure 3

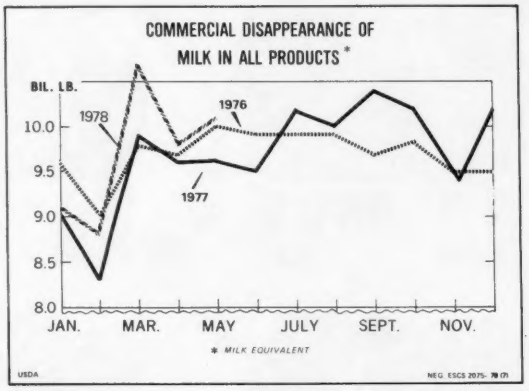


Figure 4

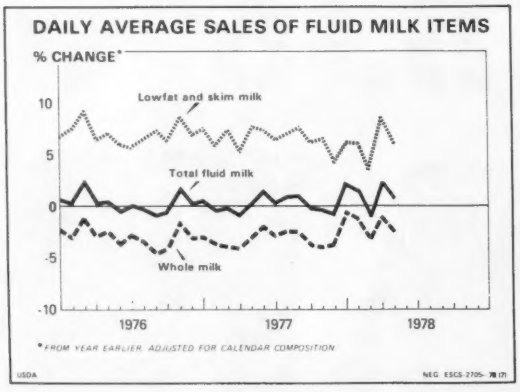


Figure 5

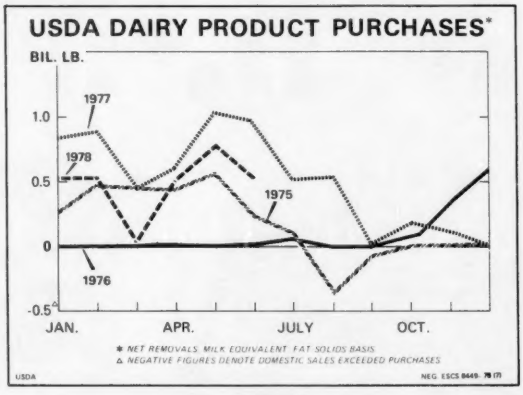


Figure 6

In This Issue

	Page
Milk Output Below 1977 — No increase in output per cow...Culling stays heavier...Milk-feed price relationships to remain good...Milk production decline of 1 percent seen for 1978	5
Dairy Supply-Demand Conditions Tightening — Farm milk prices and wholesale prices to move above support this summer... USDA stocks will limit advances...Retail dairy prices to rise and 1978 average to be up 5 to 7 percent	7
Milk Diverted From Butter-Powder to Cheese — Supplies of milk for manufacturing to remain lower...Cheese and butter sales still posting large gains...Fluid sales also higher	10
Commercial Cheese Stocks Low — Industry butter holdings just adequate... USDA purchases to drop	14
Cheese Imports Larger — Imports of other products mixed...Commercial exports smaller...Nonfat dry milk donations larger...EC milk output grows but stocks lower	20
Special Article — Changing Utilization of Milk and Components of Milk: Implications for the Future	25
List of Tables	32

Principal Contributors:
James J. Miller (202)447-8915
Charles N. Shaw (202)447-8915

Economics, Statistics, and Cooperatives Service
U.S. Department of Agriculture
Washington, D.C. 20250

Approved by the World Food and Agriculture Outlook and Situation Board.

SUMMARY

After a period of large purchases under the price support program and wholesale prices close to support levels since the last quarter of 1976, supply-demand conditions in the dairy markets are tightening. The combination of strong demand, weakening milk production, and the current low commercial stocks indicates that wholesale dairy product prices and farm milk prices will move above support prices this summer and further seasonal rises are likely this fall.

Sales of milk and dairy products were up more than 4 percent (2 billion pounds milk equivalent) during the first 5 months of 1978. Strong gains in cheese and butter sales and small increases in fluid sales have led to the overall gains. While the rate of increase in dairy sales probably will slow in coming months, demand is expected to remain strong.

Even though income conditions for dairymen have remained favorable, milk production has weakened considerably since last fall, possibly indicating a slight downward readjustment after the very sharp boosts of the preceding 2 years. Later this year, milk production is expected to sta-

The *Dairy Situation* is published in March, May, July September, and December.

bilize at a level below last year's accelerating output and the 1978 total may be about 1 percent below 1977's 123 billion pounds.

With a brisk demand for American cheese to add to commercial stocks and merely adequate commercial butter stocks, the demand for stocks will add to wholesale price strength this summer. However, the availability of large USDA stocks of butter at 110 percent of the support purchase price will limit potential price advances and forestall a repetition of the sharp jumps of late 1973 and late 1975.

The spring declines in milk output from a year ago resulted from sharpened declines in milk cow numbers with almost no gain in output per cow. The reduction in cow numbers has been more pronounced than last year because of the high slaughter cow prices and much better off-farm employment opportunities. Milk production per cow (particularly in May) probably was affected by the slow pasture growth, but dairymen were also showing restraint in boosting concentrate feeding—even though milk-feed price relationships stayed favorable.

Pressures for increased herd culling probably will remain in coming months and the year-to-year declines in dairy cow numbers could sharpen further. With the expected favorable milk-feed price relationships, output per cow probably will recover somewhat but will lack the stimulus provided last year by falling feed prices.

Farmers received an average $10.00 per 100 pounds of milk in June, up 6 percent from a year earlier. When adjusted for fat content, manufacturing grade milk prices were just slightly below the support price. In coming months, farm milk prices will reflect rising wholesale prices.

Cash receipts from dairying in the second quarter were up about 6 percent from a year ago, about the same rise as the index of prices paid for production items. In coming months, the net income picture for dairy farmers may be similar to or slightly improved from the relatively favorable conditions of the 2 previous years.

In early July, wholesale dairy product prices had not yet risen much above spring levels. Retail dairy prices edged upward this spring, although the May increase from a year ago was only 5½ percent, significantly less than the averages for all foods or all consumer items. With the expected rising farm milk prices and higher marketing costs, the seasonal rise in retail prices this summer and fall likely will be substantial. For all of 1978, retail dairy prices probably will average 5 to 7 percent above last year.

The strong cheese demand has pulled milk from butter-powder operations into cheese production. In June, American cheese output was above a year ago while butter production was down. With the expected smaller supplies of milk available for manufacturing, this pattern probably will continue in coming months—at least until cheese stocks are rebuilt.

Improved consumer purchasing power and slower rises in retail dairy prices than in other retail prices were major factors in the large increases in milk and dairy product sales from last year's somewhat weak levels. Improved consumer incomes probably were especially important in the gains in cheese and nonretail butter use. Higher retail meat prices also aided cheese sales. On the other hand, demand for nonfat dry milk stayed weak this spring.

Commercial stocks of dairy products on June 1 were down sharply from last year. Industry holdings of American cheese were the lowest on that date since 1973 and butter stocks were at moderate seasonal levels.

During May-June, USDA purchased 55 million pounds of butter (down about a third from a year ago), 20 million pounds of American cheese (down about a half), and 106 million pounds of nonfat dry milk (down a fourth). During the first half of 1978, USDA removed the equivalent of 3 billion pounds of milk from the commercial market, down more than a third from a year earlier. With rising wholesale prices, price support purchases of butter and cheese probably will be small this summer, although purchases of nonfat dry milk could continue. Even with purchases slowing, USDA holdings of butter and nonfat dry milk will remain large in coming months.

During April-May, larger cheese imports pushed U.S. dairy imports above a year ago. Meanwhile, commercial exports of dairy products trailed the previous year, although exports of nonfat dry milk (mostly donations from USDA supplies) were larger.

In the European Community (EC) this spring, milk output continued to expand. However, a variety of disposal measures have been successful in keeping intervention stocks below a year ago.

DAIRY SITUATION

SITUATION AND OUTLOOK

PRODUCTION

Milk Output Falls Under 1977

Milk output in May was about 1½ percent below a year earlier before moving back to within 1 percent of last year in June. Slowly developing pastures resulted in a later seasonal peak than a year ago. First-half milk production totaled 62.7 billion pounds, just barely below a year earlier.

Milk cow numbers this spring continued to run slightly more than 1 percent below a year ago. Higher cull cow prices and improved off-farm employment opportunities have contributed to sharper declines than in 1977.

U.S. milk production

Month	1977	1978	Change
	Million pounds		*Percent*
January	9,914	9,988	+0.7
February	9,337	9,341	0
March	10,586	10,528	-0.5
April	10,743	10,686	-0.5
May	11,373	11,219	-1.4
June	11,021	10,928	-0.8
July	10,693		
August	10,397		
September	9,850		
October	9,844		
November	9,429		
December	9,770		
Total	122,957		

Milk output per cow was relatively weak this spring. After dipping below a year earlier in May (for the first time in 33 months), production per cow was just barely above a year ago in June. Part of the apparent drop and recovery is explained by the slow spring.

Milk production per cow has been particularly weak in much of the Midwest and California. Cows in California were affected by prolonged, heavy stress from the muddy lots of earlier this year. In the Midwest, dairymen may have fed from ample supplies of last season's low quality hay rather than move the cows to pasture.

Restraint in concentrate feeding may also have played a part. Dairymen reported feeding only about 3 percent more grain and other concentrates on July 1 than a year earlier, compared with boosts of 5 percent in each of the 2 previous years.

Declines in milk output from a year earlier were widespread this spring. In May-June, only the Northeast and Southern Plains regions produced more milk than last year, with sharp drops occurring in the Northern Plains and the Corn Belt. Of the 33 States reporting monthly, only a third expanded milk output in May-June, including three—Wisconsin, New York, and Pennsylvania—of the five major dairy States.

Lower Production Expected

The persistent weakness of milk output in the first half of 1978 indicates that dairymen may not be willing to sustain production at 1977 levels, even though the income picture remains similar to the relatively favorable conditions of last year. It should be remembered that the almost 8-billion-pound increase in 1975-77 was a very exceptional expansion, having been surpassed only by the 1939-42 period and approached only one other time (1952-54). It may be that after the rapid response to an almost continuous series of production-boosting changes (starting with the market price jump of late 1975), the relatively stable conditions of 1978 are resulting in a slight downward readjustment.

During the rest of the year, milk production may continue to trail 1977's accelerating output. Pressures for increased herd culling likely will remain while output per cow may not be pushed to the same extent as last year—when feed prices dropped sharply. Although expected to stabilize below a year ago, milk output probably will remain at a fairly high level. For all of 1978, milk production could total about 1 percent less than last year's 123 billion pounds.

Utility cows at Omaha were selling for about $39 per 100 pounds in early July, about $16 above a year ago. Slaughter cow prices are expected to remain high and probably will continue to encourage dairy cow slaughter. Generally, good off-farm employment opportunities may also contribute to sharper drops in milk cow numbers.

Output per cow in coming months is somewhat more problematic. Expected rising farm milk prices and moderate feed prices would keep milk-feed price relationships quite favorable. These relationships likely will result in high levels of concentrate feeding and milk production per cow. However, feeding relationships during the second half of this year probably will not be improving to

Utility cow prices, Omaha

Month	1976	1977	1978
	Dollars per cwt.		
January	23.26	22.95	27.59
February	25.90	23.88	29.45
March	27.45	26.67	32.44
April	30.72	27.63	36.94
May	30.24	26.57	39.21
June	27.47	25.64	37.61
July	25.80	25.23	
August	25.10	25.38	
September	22.90	26.12	
October	22.72	24.89	
November	20.59	23.80	
December	21.60	25.02	
Average	25.31	25.32	

the extent they were when feed prices fell in the second half of 1977. Output per cow probably will average above a year earlier during the rest of 1978, but the gains could be relatively small compared with last year's accelerating levels.

Milk-Feed Price Relationships To Stay Favorable

The combination of milk prices well above a year ago and feed prices somewhat below a year earlier have resulted in quite favorable milk-feed price relationships. The difference in value between 100 pounds of milk and 100 pounds of concentrate ration was $3.71 in June, up a third from a year ago. Similarly, the milk-feed price ratio stood at 1.6 (pounds of concentrate ration equal in value to a pound of milk), up from 1.4 a year earlier (figure 7). With milk prices rising, milk-feed price relationships probably will stay favorable during

Milk-feed price ratio[1]

Month	1976	1977	1978
	Pounds		
January	1.65	1.51	1.69
February	1.58	1.46	1.70
March	1.58	1.45	1.68
April	1.53	1.42	1.62
May	1.49	1.40	1.60
June	1.43	1.43	1.59
July	1.44	1.52	
August	1.50	1.65	
September	1.51	1.76	
October	1.56	1.79	
November	1.60	1.76	
December	1.55	1.72	
Average	1.53	1.57	

[1] Pounds of concentrate ration equal in value to 1 pound of milk.

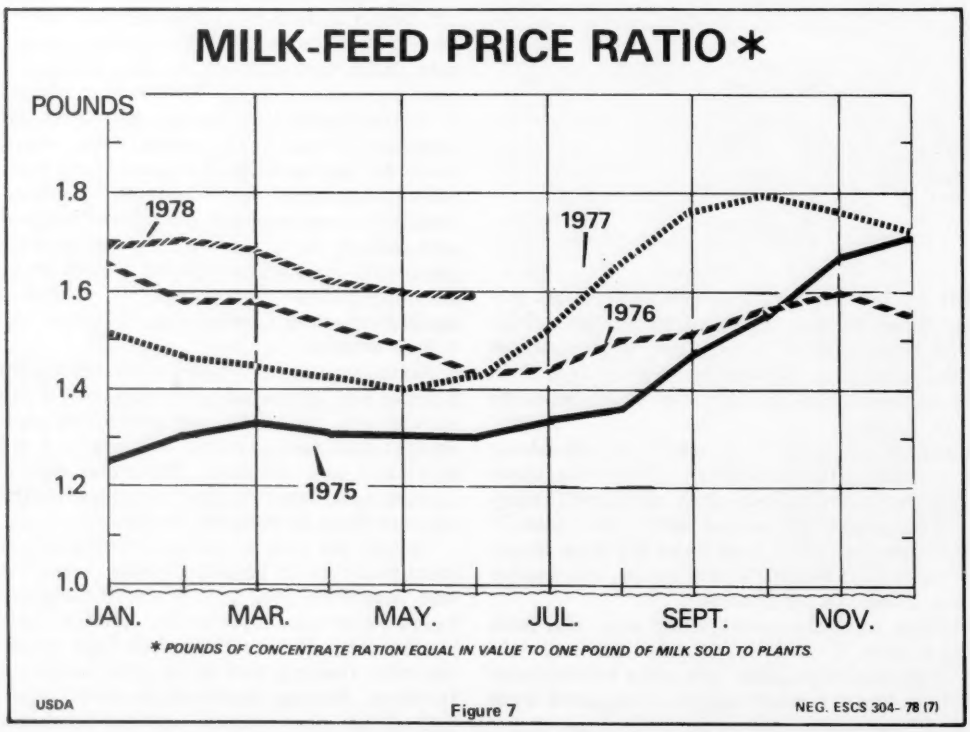


Figure 7

the rest of 1978—unless crops here and abroad are reduced by bad weather.

Early season prospects are for large feed crops in 1978. Based on conditions as of July 1, the corn crop is forecast at 6.15 billion bushels, down 4 percent from last year's record but still the third largest ever. Although planted late, the crop was in generally good condition and yields are forecast to be just slightly below 1977. Acreage planted to soybeans this year is up 9 percent from last year and 28 percent from 2 years ago.

If feed crops are not sharply reduced by bad weather, feed prices to dairymen probably will continue moderate. Expected large stocks of corn from last year's harvest will also help to limit potential price advances. However, stocks of soybeans at harvest likely again will be somewhat tight.

In early July, corn prices at Chicago were about $2.30-$2.40 (No. 2 yellow), up about 25 cents from a year ago. Soybean meal at Decatur was about $175 per ton, up about $10. Farmers paid an average $140 per ton for 16-percent dairy ration in June, down about $9 from a year earlier. Unlike feed ingredient prices, the prices of the commercially mixed feed have been fairly steady since last December.

On the roughage side, farmers paid an average of $65 per ton for alfalfa hay in June, down $11 from a year ago and the lowest since 1974. Hay prices have been reduced by the large carryover stocks resulting from last year's large crop and the smaller beef herd.

Although developing slowly, pastures in most of the important dairy areas have stayed in good condition thus far this season. At a July 1 rating of 85 nationwide, pastures were good to excellent and generally better than last year.

PRICES AND INCOME

Farm Milk Prices To Rise

Unless milk production strengthens or commercial use drops dramatically, farm milk prices likely will start to move upward this summer. Replenishing the low commercial stocks of June 1 will add to demand as milk output starts to contract seasonally. Anticipation of the required support price increases on October 1 will lend additional strength to farm milk prices. However, a sharp summer rise in milk prices is not likely, unless milk output continues to weaken. Even so, this would be the first significant rise from support level in almost 2 years.

Farmers received an average $10.00 per 100 pounds of milk in June, up about 6 percent from a year earlier. The seasonal decline since the start of the year was relatively modest (less than the drop in value due simply to lower fat test) because of the April 1 adjustment to the support price and the strengthening market conditions.

Milk prices received by farmers

Month	All sold to plants			Manufacturing grade		
	1976	1977	1978	1976	1977	1978
	Dollars per 100 pounds					
January	10.10	9.65	10.20	9.04	8.48	9.12
February	9.76	9.54	10.20	8.42	8.41	9.18
March	9.75	9.43	10.20	8.49	8.46	9.23
April	9.40	9.43	10.10	8.45	8.66	9.28
May	9.25	9.34	10.00	8.33	8.60	9.27
June	9.14	9.38	10.00	8.32	8.55	9.25
July	9.43	9.50		8.62	8.58	
August	9.70	9.69		8.89	8.64	
September	9.84	10.00		8.65	8.83	
October	9.96	10.20		8.54	8.99	
November	9.89	10.20		8.54	9.10	
December	9.72	10.30		8.53	9.16	
Average	9.66	9.72		8.56	8.70	

Manufacturing grade milk prices averaged $9.25 per 100 pounds in June, up 8 percent from a year earlier. Adjusted to annual average fat test, the June level was just slightly below the support price. Similarly, the Minnesota-Wisconsin (M-W) price for manufacturing grade milk rose a penny to $9.26 in June.

Minimum Class I prices in Federal order markets will average $11.36 per 100 pounds in August. Reflecting changes in the M-W price (the mover of Class I prices in Federal order markets), minimum Class I prices have risen every month since last December.

The increase in Class I prices announced by cooperatives in April and May generally had been matched by rises in Federal order minimum prices by June. During the first four months of the year, over-order payments to cooperatives were stable and averaged about 26 cents per 100 pounds. In May, this average had increased to around 33 cents per 100 pounds but was pared down to an estimated 25 cents in June. Indications are that the over-order charges will increase this fall and winter. As a result of continuing increases in transportation and other costs and tighter milk supplies, handlers—especially those who must import milk during the short production season—probably will be making higher over-order payments this year than they have in the last 2 years.

Although the timing of prices moving above the support price is still in doubt, farm milk prices this summer will average higher than the suppor price and could be up 8 to 10 percent from a year ago. Further seasonal movement is likely this fall since the support price probably will be raised substan-

tially on October 1 to meet the legal minimum of 80 percent of parity. There might even be enough market strength to keep fall milk prices above the increased support level.

Cash Receipts Higher

Cash receipts from dairying during the second quarter were up about 6 percent from a year earlier, as higher milk prices were only partially offset by slightly smaller marketings. During the rest of 1978, cash receipts will stay well above a year ago because of higher milk prices.

The index of prices paid for production items during April-June averaged about 6 percent higher than a year ago. However, this index was boosted by sharply higher prices for feeder livestock—which do not constitute a major cost for dairymen. Net income positions for dairymen probably were slightly better than the relatively favorable condition of last year. With the expected rise in farm milk prices, this may continue to be true during the rest of 1978.

Wholesale Prices Steady

Wholesale prices of most major dairy products have held fairly steady since April. Market prices have essentially reflected support purchase prices. However, this probably will change quickly as markets react to tightening supply-demand conditions.

Wholesale American cheese prices may well be the first to start upward, since commercial holdings are quite low relative to commercial use. However, prices of 40-pound blocks at Wisconsin assembly points were still close to the support purchase price in early July (figure 8). Barrel cheese was quoted at a relatively typical differential of about 4 cents per pound below the block price. Wholesale American cheese prices probably will have to rise enough to draw sufficient milk into cheese production to bring commercial stocks into line with market needs.

There are only moderate industry stocks of butter, so wholesale butter prices probably will follow the rising cheese prices. Although demand conditions for butter probably will not be as strong as for cheese, the diversion of milk to cheese plants could result in substantial increases in butter prices.

Nonfat dry milk prices appear to be in the weakest position of the prices for the three major dairy products. Even with a strong curtailment of output, supplies of powder probably will be sufficient to

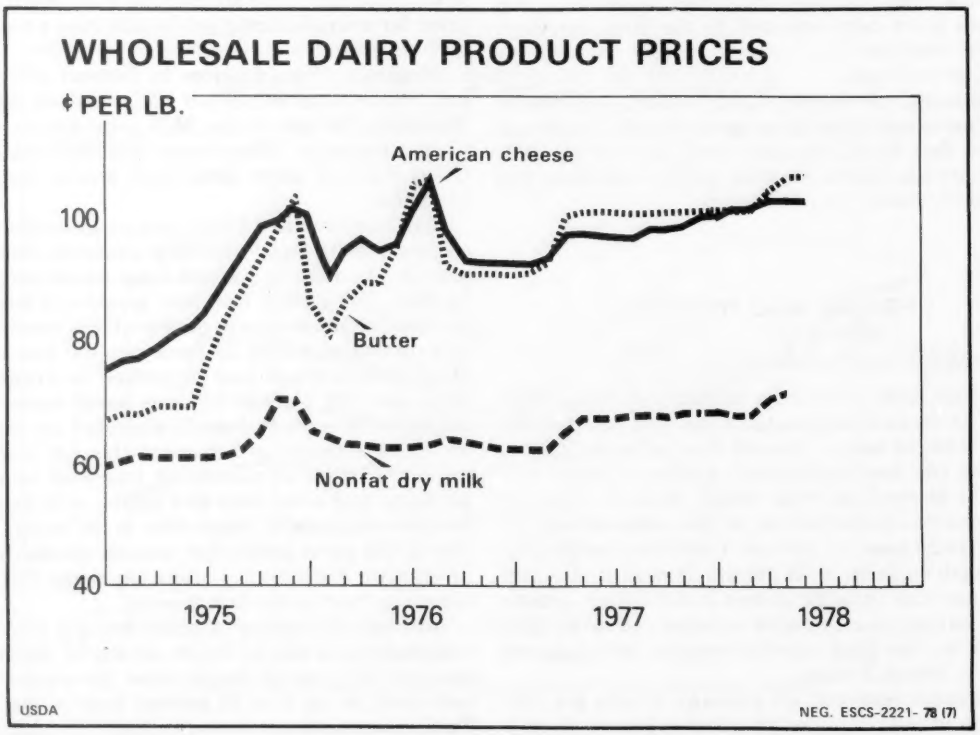


Figure 8

meet the expected rate of usage. However, some small wholesale price increases are possible, especially if users become sufficiently concerned to start building their inventories.

The eventual magnitude of price rises during the second half is still rather unclear. If milk production and commercial use materialize as expected, wholesale price increases probably will be substantial but much smaller than those of 1975. The availability of large government stocks of butter for sale back to the industry (at 110 percent of the support purchase price) will place a ceiling on wholesale butter prices—which in turn will limit advances in cheese prices.

Edible dry whey prices have edged upward since mid-May, despite record-large output. In early July, nonhygroscopic whey was traded at about 13 cents per pound in the Central States production area, up about a penny from the May low. If demand for dry whey remains brisk, wholesale prices could post a sizable seasonal rise, although the expected expansion in cheese output may keep dry whey prices below last fall's levels.

Wholesale prices of both ice cream and evaporated milk in June were up almost 7 percent from a year ago. In both cases, increases in other key costs have resulted in larger price rises than for other dairy products.

In June, the wholesale price index for dairy products, as reported by the Bureau of Labor Statistics (BLS), stood at 185.4 (1967=100), up just over 6 percent from last year. This index will rise this summer and autumn as dairy markets tighten.

Retail Dairy Prices Edge Higher

Retail dairy prices in May were up just slightly from last winter and only 5½ percent from a year earlier. The year-to-year increase in retail prices of milk and dairy products remained significantly smaller than the rises in the average for all foods and the average for all items.

Rises in retail dairy prices have been moderated by the slowness of expansion in the farm-retail price spread. This price spread was only 2 percent larger than a year earlier last fall and winter. Although the year-to-year increase was slightly larger this spring, it still significantly trailed the rate of inflation in the general economy.

In May, retail prices of butter and ice cream were up 6 to 7 percent from a year earlier, while prices of processed American cheese were about 9

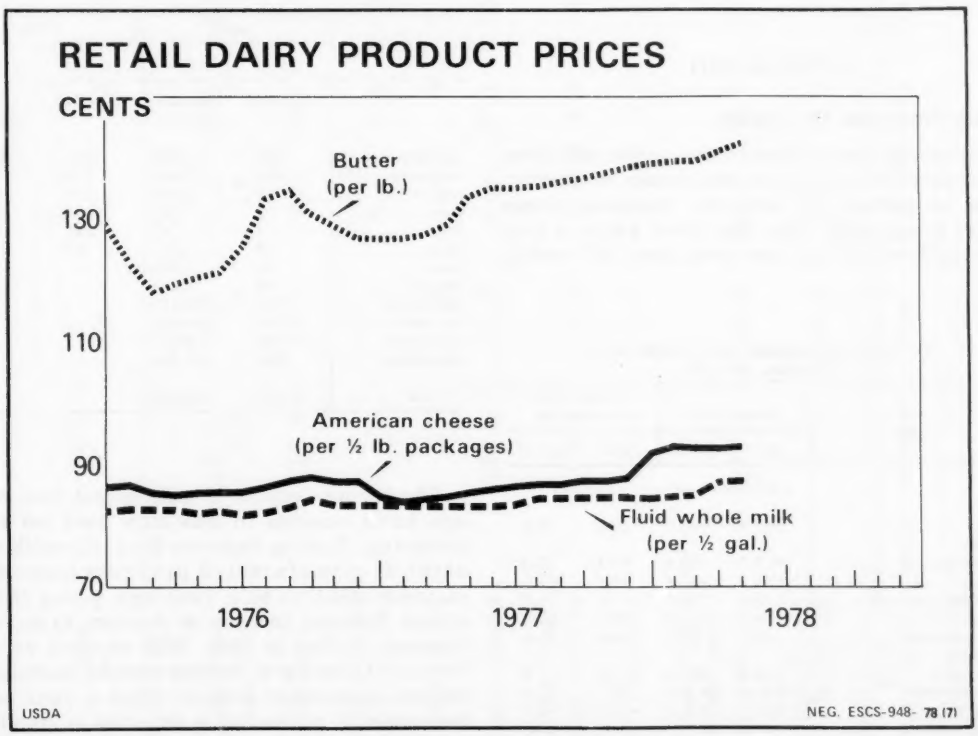


Figure 9

Retail dairy product prices

Item	Unit	May 1976	May 1977	Nov. 1977	May 1978
All dairy products	1967=100	167.4	173.1	176.5	182.8
Butter	c/lb.	120.6	133.8	137.4	142.4
Processed American cheese	c/½-lb.	85.7	85.7	87.5	93.6
Ice cream	c/½-gal.	125.3	134.7	137.9	144.3
Whole milk: At stores	c/½-gal.	82.0	83.5	84.6	87.2
Evaporated milk	c/can	34.1	36.0	37.2	38.8
Skim milk: At stores	c/qt.	44.5	45.7	46.4	47.4

percent higher (figure 9). Rises in supermarket prices for fluid milk continued quite moderate, up only 4 percent from last year.

With the expected rising farm milk prices and higher processing and marketing costs, retail dairy prices this summer and fall likely will post a substantial seasonal rise. However, the large USDA stocks of butter and nonfat dry milk will forestall repetition of the very sharp increases of 1973 and 1975. For all of 1978, retail dairy prices probably will average 5 to 7 percent above last year, although the increases this fall likely will be larger than the annual average.

UTILIZATION

Cheese Production Up Slightly

The strong cheese demand has pulled milk from butter-powder operations into cheese production. Based on preliminary estimates, American cheese output since early June has been above a year ago—the first such increase since May 1977—while butter production was down. With the expected smaller supplies of milk available for manufacturing, this pattern probably will continue in coming months—at least until cheese stocks are rebuilt.

During the first 5 months of this year, the nearly 2-percent decline from year-earlier levels in American cheese production was more than offset by a nearly 10-percent increase in production of other-than-American types, although the gains in those types slowed considerably during April-May.

Butter production thus far in 1978 has eased from 3 percent above year-earlier levels in January to 6 percent below in May. Nonfat dry milk production, which fell under year-earlier levels in February, has continued to decline and was down more than a tenth in April-May.

Among other products, April-May output of ice cream was about the same as last year, output of canned milk was considerably lower, and production of dry whole milk showed a substantial increase. More edible dry whey and whey products for animal feed were produced, while less modified dry whey products for human food and condensed whey were produced.

Production of selected manufactured dairy products, 1977-78

Item	January-May		Change from year earlier	
	1977	1978[1]	1977	1978[1]
	Million pounds		*Percent*	
Butter	502.4	497.0	+12.7	-1.1
Cheese:				
American	917.7	899.8	+7.1	-2.0
Other	530.7	581.5	+3.9	+9.6
Cottage, creamed	372.9	373.7	+.2	+.2
Canned milk	366.6	326.9	-14.8	-10.8
Dry whole milk	34.0	33.9	-8.8	-.3
Ice cream (Mil. gal.)	318.1	318.0	-2.6	0
Milk equivalent[2]	28,663	28,564	+6.1	-.3
Nonfat dry milk	455.6	434.2	+12.4	-4.7

[1] Preliminary. [2] Total all reported manufactured products.

Wisconsin out-of-state milk shipments

Month	1977		1978	
	Loads	Volume	Loads	Volume
	Number	*Thousand pounds*	*Number*	*Thousand pounds*
January	206	9,682	206	9,682
February	163	7,661	314	14,758
March	59	2,773	239	11,233
April	6	282	183	8,601
May	1	47	154	7,238
June	28	1,316	57	2,679
July	85	3,995		
August	40	1,880		
September	491	23,077		
October	347	16,309		
November	396	18,612		
December	292	13,724		
Total	2,114	99,358		

The spring declines in milk output from a year ago have resulted in less milk used for manufacturing. During January-May, the milk equivalent of manufactured products consistently slipped relative to a year ago, going from an almost 3-percent increase in January to an almost 3-percent decline in May. Milk supplies available for manufacturing in coming months probably will remain somewhat smaller than a year earlier because milk production is expected to stabilize at slightly lower levels.

Table 1--Commercial disappearance: Total milk, annual and by quarters, 1976-78 1/

Item	1976	1977					1978 2/				
		By quarters				Annual	By quarters				Annual
		1st	2nd	3rd	4th		1st	Apr.-May	3rd	4th	
		Billion pounds									
Production	120.3	29.8	33.1	30.9	29.0	123.0	29.9	21.9			
Farm use	3.0	.7	.7	.7	.7	2.8	.7	.5			
Marketings	117.3	29.1	32.4	30.2	28.3	120.1	29.2	21.4			
Beginning commercial stocks	3.7	5.3	5.5	7.1	6.0	5.3	4.9	4.8			
Imports	1.9	.5	.4	.4	.7	2.0	.5	.3			
Total supply	123.0	34.9	38.3	37.7	35.0	127.4	34.6	26.5			
Ending commercial stocks	5.3	5.5	7.1	6.0	4.9	4.9	4.8	5.4			
Net removals	1.2	2.1	2.6	1.1	.3	6.1	1.2	1.3			
Commercial disappearance											
Actual	116.4	27.2	28.6	30.6	29.8	116.4	28.6	19.8			
Percent change 3/	+2.3	4/-2.8	-3.4	+3.5	+3.6	0	+5.1	+3.5			

1/ Milk equivalent, fat solids basis. Totals may not add due to rounding. 2/ Preliminary. 3/ From year earlier using unrounded data. 4/ On a daily average basis.

Table 2--Commercial disappearance: Selected dairy products, United States, annual 1969-77, by quarters, 1977-78

Year and quarter	Butter 1/	Cheese		Nonfat dry milk	Canned milk	Frozen products 3/
		American 2/	Other			
	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. gal.
1969	921.9	1,281.0	861.6	1,042.1	1,376.1	1,092.2
1970	898.2	1,398.0	909.1	983.2	1,213.8	1,097.3
1971	847.1	1,454.8	987.0	981.8	1,186.9	1,102.4
1972	885.4	1,595.7	1,127.8	919.2	1,102.6	1,108.6
1973	855.6	1,677.1	1,210.2	1,110.1	1,056.7	1,118.6
1974	929.9	1,780.6	1,276.5	809.9	999.5	1,128.0
1975	951.0	1,717.1	1,331.9	697.0	923.9	1,183.9
1976	919.0	1,920.9	1,458.0	719.2	899.0	1,154.0
1977	859.2	1,958.1	1,512.3	681.6	799.2	1,147.4
1977 - 1st	208.6	464.8	347.1	202.5	203.9	246.0
2nd	166.1	482.5	369.6	127.8	183.0	327.3
3rd	233.0	486.1	377.2	185.6	183.7	342.3
4th	251.1	524.4	417.8	165.8	228.8	231.9
1978 - 1st	237.3	530.1	386.3	182.5	194.8	243.7
Apr.-May	132.1	358.2	257.1	83.4	121.0	203.4
3rd						
4th						
	1977-78 percent change					
	Percent					
1st	+13.8	+14.0	+11.3	-9.9	-4.5	-.9
Apr.-May	+8.9	+12.1	+5.3	-1.8	-5.3	-.3
3rd						
4th						

1/ Imports include butter equivalent of butteroil. 2/ Imports include Colby cheese; stocks do not include processed cheese. 3/ Excludes Mellorine.

Table 3--Milk and dairy product sales (domestic disappearance, commercial sources) total and per capita, selected years, United States, 1970-77 1/

Year	Fluid milk product sales 10/					Butter	Cheese			Evaporated and condensed	
	Fluid whole milk	Cream 2/	Low-fat milk 3/	Total product weight	Whole milk equivalent 4/		Whole and part skim milk 5/		Cottage cheese 6/	Whole milk	Skimmed milk
							American	Other			
	Total										
	Million pounds										
1970	42,956	1,067	10,289	54,312	51,998	902	1,393	892	1,060	1,349	1,016
1971	42,108	1,076	11,485	54,669	51,853	878	1,452	971	1,108	1,303	1,039
1972	41,851	1,093	12,826	55,770	53,227	861	1,573	1,110	1,133	1,236	980
1973	40,443	1,130	14,062	55,635	52,413	846	1,661	1,193	1,103	1,194	894
1974	38,358	1,143	14,815	54,316	50,514	917	1,771	1,267	992	1,154	732
1975	38,256	1,175	16,558	55,989	51,123	948	1,692	1,317	1,006	1,097	761
1976	37,061	1,189	17,710	55,960	51,505	932	1,912	1,446	1,025	1,046	783
1977 7/	35,750	1,208	18,944	55,902	51,389	865	1,938	1,493	1,032	934	869
	Per capita 8/										
	Pounds										
1970	214	5.3	51.3	271	259	4.4	6.8	4.4	5.2	6.6	5.0
1971	207	5.3	56.5	269	255	4.3	7.0	4.7	5.4	6.3	5.0
1972	204	5.3	62.5	272	259	4.1	7.6	5.3	5.4	5.9	4.7
1973	195	5.5	67.9	269	253	4.0	7.9	5.7	5.3	5.7	4.3
1974	184	5.5	70.9	260	242	4.3	8.4	6.0	4.7	5.5	3.5
1975	181	5.6	78.5	266	243	4.4	8.0	6.2	4.7	5.1	3.6
1976	174	5.6	83.3	263	242	4.3	8.9	6.7	4.8	4.9	3.6
1977 7/	167	5.6	88.4	261	240	4.0	9.0	6.9	4.8	4.3	4.0

	Frozen products				Dry products				
	Ice cream	Ice milk	Sherbet	Other	Mellorine	Whole milk	Nonfat dry milk	Buttermilk	Whey 9/
	Total								
	Million pounds								
1970	3,656	1,577	318	40	249	43	960	51	294
1971	3,676	1,582	317	47	232	32	958	55	319
1972	3,685	1,599	325	53	218	24	853	48	377
1973	3,714	1,604	346	70	191	21	1,056	39	384
1974	3,753	1,629	325	56	166	15	839	44	453
1975	4,015	1,643	316	66	144	16	668	44	477
1976	3,928	1,574	322	64	112	33	743	38	524
1977 7/	3,860	1,613	325	71	90	34	698	57	526
	Per capita 8/								
	Pounds								
1970	17.9	7.7	1.6	0.2	1.2	0.2	4.7	0.3	1.5
1971	17.8	7.7	1.5	.2	1.1	.2	4.6	.3	1.6
1972	17.7	7.7	1.6	.3	1.0	.1	4.1	.2	1.8
1973	17.7	7.6	1.6	.3	.9	.1	5.0	.2	1.8
1974	17.8	7.7	1.5	.3	.8	.1	4.0	.2	2.1
1975	18.8	7.7	1.5	.3	.7	.1	3.1	.2	2.2
1976	18.3	7.3	1.5	.3	.5	.2	3.5	.2	2.4
1977 7/	17.8	7.5	1.5	.3	.4	.2	3.2	.3	2.4

1/ Excludes milk used on farms where produced and distribution from USDA supplies; includes sales to the Armed Services for use in the United States.
2/ Includes milk and cream mixtures.
3/ Includes skim milk, buttermilk, and flavored milk drinks.
4/ Fat solids basis.
5/ Excludes cottage cheese.
6/ Includes full-skim American.
7/ Preliminary.
8/ Based on resident population, except fluid milk product sales--based on estimated population using fluid products from purchased sources.
9/ Includes modified whey products starting 1975.
10/ Different series than formerly published. For more information see pages 31-37, DS-345, May 1973.

Commercial Use Stays Strong

Led by strong sales of cheese and butter and aided by small increases in fluid sales, commercial use of milk in all dairy products during the first 5 months of this year was up more than 4 percent from last year and no slackening has yet occurred (table 1). While gains of this magnitude likely will not continue in coming months, the demand picture nevertheless remains bright and commercial use of milk and dairy products for all of 1978 could be up more than 2 percent from the near-record level of 1977.

Commercial disappearance of butter in April-May was up 9 percent from a year earlier, following a nearly 14-percent increase in the first quarter of this year (table 2). Much of this increase probably occurred in the nonretail sector, with additional usage in other products and in away-from-home eating establishments.

Changes in dairy sales from year earlier

Item	Change	
	Jan.-Mar.	Apr.-May
	Percent	
Total milk[1]	+5.1	+3.5
Manufactured products:		
American cheese	+14.0	+12.1
Other cheese	+11.3	+5.3
Cottage cheese[2]	0	+2.5
Butter	+13.8	+8.9
Ice cream	0	-.1
Ice milk	-4.0	-.5
Canned milk	-4.5	-5.3
Nonfat dry milk	-9.9	-1.8
Fluid products:	+.9	+1.5
Whole milk	-1.6	-1.8
Skim and lowfat milk	+5.4	+7.2
Cream and mixtures	-.7	N.A.

[1] On a milk equivalent, fat-soilds basis. [2] Creamed and low-fat.

Commercial disappearance of American cheese posted a 12-percent gain in April-May from last year's relatively weak sales, just a slightly smaller increase than during the first quarter. Other-than-American types posted a 5-percent gain following a very strong jump during the first quarter of the year. Cheese sales likely will remain brisk as the higher retail meat prices and improved consumer incomes continue to impact favorably on cheese sales.

Fluid milk sales were slightly above a year earlier this spring; gains in sales of lowfat milk more than offset declines in whole milk use. Retail milk prices have continued to rise more slowly than prices of other beverages or foods.

On the other hand, commercial use of nonfat dry milk continued weak in April-May. The nearly 2-percent drop from 1977 reflected the higher wholesale prices and continued shrinkage of the market.

Among other products, frozen dessert sales in April-May were about the same as last year's levels, while sales of both creamed and lowfat cottage cheese posted strong gains. Commercial disappearance of canned milk declined 5 percent.

1977 Per Capita Fluid Sales Down

For the second year in a row, total sales of fluid milk and cream in 1977 were virtually unchanged from a year earlier, resulting in a per capita decline of about 1 percent. Although retail milk prices were just barely above 1976, fluid sales in 1977 may have reflected some lingering impact of the sharp price increases of 1976. Per capita sales of beverage milks were down more than 1 percent, but this drop was partially offset by an increase in use of cream and specialty products.

Longrun trends in per person sales of beverage milks continued to shape the 1977 data (tables 5-7). The drop in whole milk sales was similar to the previous year, but the increase in per capita sales of lowfat milk was slightly smaller. Per person sales of flavored milk kept rising while buttermilk sales resumed a downtrend.

Yogurt sales continued their phenomenal growth (figure 10). Per capita use in 1977 was up almost a fifth from 1976 and has almost doubled in 5 years. Yogurt sales have expanded by attracting new users, by expanding the amounts eaten by prior users, and by introducing new forms.

Cream sales in 1977 were up slightly from a year earlier. Small declines in per capita sales of half-and-half and plain cream items were outweighed by increases in sour cream and eggnog sales per person.

Commercial Stocks Low

Commercial holdings of American cheese were down about a fifth from the record high level of a year earlier on June 1. The 369 million pounds were the lowest on that date since 1973 and remain tight relative to the record level of current and expected sales. Seasonal increases in those stocks have started very slowly this spring with milk production running below a year earlier and cheese sales strong. The rebuilding of stocks (a demand-strengthening factor) should help pull farm milk prices above the support price sooner than earlier anticipated. June 1 commercial stocks of other-than-American varieties were moderate.

Commercial stocks of nearly 50 million pounds of butter also were moderate on June 1. However, they were still down 13 percent from a year earlier and almost a fourth lower than the 1976 record level for that date.

Table 4--Sales of individual fluid products as a proportion of average daily fluid milk sales, all Federal order markets, 1965, 1970, and 1974-77

Fluid items	1965 1/	1970	1974	1975	1976	1977
				Percent		
Whole milk 2/	83.7	76.1	67.6	65.6	63.4	61.1
Flavored whole milk	2.6	2.5	2.7	2.6	2.7	2.7
Total whole milk items	86.3	78.6	70.3	68.2	66.1	63.8
Low-fat (2%) milk	3/	12.1	18.5	21.4	22.8	24.4
Plain	3/	3.3	9.3	11.6	4.3	15.8
Solids added	3/	8.8	9.2	9.8	8.5	8.6
Skim milk	8.6	4.3	5.4	4.2	4.3	4.5
Plain	2.8	1.1	1.8	1.7	1.9	2.1
Solids added	5.9	3.2	3.6	2.5	2.4	2.4
Buttermilk	4/ 2.0	1.9	1.8	1.8	1.8	1.8
Yogurt	---	.3	.6	.7	.8	1.0
Flavored milk drinks	.7	.8	1.3	1.5	2.0	2.4
Total skim and low-fat milk items 5/	11.3	19.4	27.6	29.6	31.7	34.1
Milk and cream mixtures	1.3	1.1	.9	.9	.9	1.0
Light cream	.4	.2	.2	.2	.2	.1
Heavy cream	.3	.2	.2	.2	.2	.2
Sour cream	.3	.4	.5	.6	.6	.7
Total cream items 5/	.9	.8	.9	1.0	1.0	1.0
Eggnog	.1	.2	.2	.2	.2	.2
Total fluid milk and cream 5/	100.0	100.0	100.0	100.0	100.0	100.0

1/ Excludes New York-New Jersey market.
2/ Includes whole milk equivalent of small quantity of concentrated milk.
3/ Included with skim milk.
4/ Includes small quantities of yogurt and cultured specialities.
5/ Totals may not add due to rounding.

Table 5--Sales of individual beverage milk products, United States, 1954-77

Year	Plain whole milk	Low-fat milk	Skim milk	Filled and imitation milk	Flavored milk and drinks	Buttermilk	Total
				1,000 pounds			
1954	38,604,960	34,240	961,460	0	1,070,850	1,218,300	41,889,810
1955	39,915,940	50,030	1,046,750	0	1,146,650	1,236,580	43,395,950
1956	41,277,190	66,510	1,182,590	0	1,188,750	1,195,880	44,910,920
1957	42,217,840	80,540	1,351,600	0	1,162,660	1,184,010	45,996,650
1958	42,382,790	192,410	1,491,710	0	1,180,050	1,159,810	46,344,770
1959	42,548,300	284,540	1,648,330	0	1,189,280	1,151,930	46,822,380
1960	42,999,350	389,180	1,830,140	0	1,200,250	1,139,730	47,558,650
1961	42,606,330	600,960	1,977,610	0	1,278,160	1,092,480	47,555,540
1962	43,039,510	840,020	2,078,490	0	1,343,060	1,159,920	48,461,000
1963	43,749,260	1,170,690	2,227,840	0	1,489,730	1,171,890	49,809,410
1964	44,205,430	1,605,890	2,336,180	0	1,570,800	1,166,260	50,884,560
1965	44,512,450	2,056,550	2,368,030	0	1,646,860	1,155,750	51,739,640
1966	44,671,870	2,769,740	2,097,370	3,100	1,720,380	1,155,030	52,417,490
1967	43,218,510	3,550,750	2,077,110	45,600	1,662,250	1,139,350	51,693,570
1968	42,705,970	4,427,400	2,207,370	163,610	1,757,620	1,142,030	52,404,000
1969	41,934,850	5,396,130	2,320,250	153,620	1,748,690	1,146,670	52,700,210
1970	41,511,710	6,162,570	2,378,400	122,490	1,762,900	1,134,950	53,073,020
1971	40,595,920	7,287,010	2,345,370	108,580	1,870,720	1,149,350	53,356,950
1972	40,252,266	8,277,310	2,608,977	96,610	2,001,614	1,156,468	54,393,245
1973	38,849,170	9,189,215	2,949,038	81,339	2,044,324	1,075,229	54,188,315
1974	36,908,055	9,778,193	2,970,078	74,503	2,083,346	1,015,804	52,829,979
1975	36,924,145	11,703,142	2,528,589	56,804	2,122,585	1,031,831	54,367,096
1976	35,668,574	12,621,789	2,555,072	44,783	2,364,493	1,035,401	54,290,112
1977 1/	34,368,065	13,521,082	2,635,669	39,554	2,532,433	1,017,992	54,114,795

1/ Preliminary.

Table 6--Sales of individual cream and specialty products, United States, 1954-77

Year	Half-and-half	Light cream	Heavy cream	Sour cream and dips	Imitation sour cream	Yogurt	Eggnog	Total
				1,000 pounds				
1954	559,400	372,880	209,530	96,980		14,960	32,170	1,285,920
1955	604,820	351,750	205,860	100,520	0	16,850	36,250	1,316,050
1956	652,330	335,470	207,180	105,980	0	18,760	36,200	1,355,920
1957	687,560	304,070	202,100	113,490	0	21,160	38,080	1,366,460
1958	722,050	283,770	193,730	123,730	0	25,630	42,790	1,391,700
1959	748,800	264,130	183,740	136,810	0	38,330	45,850	1,417,600
1960	795,500	250,070	177,940	154,440	0	44,130	45,840	1,467,920
1961	805,960	231,360	169,190	163,310	0	48,580	46,080	1,464,480
1962	785,090	220,110	173,700	175,330	0	45,520	49,610	1,449,360
1963	773,140	192,740	167,720	184,280	0	50,240	49,420	1,417,540
1964	759,870	175,020	162,190	172,480	0	53,020	47,140	1,369,720
1965	749,180	162,420	157,210	178,750	0	60,640	48,770	1,356,970
1966	732,230	143,770	148,420	186,100	30	70,030	52,290	1,332,870
1967	687,040	125,000	138,620	182,520	730	90,230	50,440	1,274,580
1968	661,880	101,930	127,200	186,900	1,640	123,520	57,750	1,260,820
1969	632,170	90,500	113,450	189,830	1,680	168,960	56,920	1,253,510
1970	593,420	75,980	112,310	222,600	1,750	171,570	61,330	1,238,960
1971	560,910	66,610	112,490	251,320	1,910	236,290	82,640	1,312,170
1972	552,962	57,208	116,925	268,269	1,660	284,036	96,326	1,377,386
1973	559,614	80,470	121,576	276,126	N.A.	317,934	92,018	1,447,738
1974	528,760	84,107	118,559	315,840	N.A.	343,225	95,443	1,485,934
1975	525,198	89,325	121,480	358,080	N.A.	445,435	81,900	1,621,418
1976	538,385	77,248	130,986	355,106	N.A.	481,707	86,857	1,670,289
1977 1/	541,219	68,881	126,334	375,706	N.A.	578,814	95,915	1,786,869

1/ Preliminary.

Table 7--Per capita sales of selected fluid milk items, 1954-77

Year	Plain whole milk	Lowfat milk	Skim milk	Flavored milk and drinks	Butter-milk	Yogurt	Eggnog	Half-and-half	Light cream	Heavy cream	Sour cream and dips
					Pounds						
1954	262.44	0.23	6.54	7.28	8.28	0.10	0.22	3.80	2.53	1.42	0.66
1955	264.69	.33	6.94	7.60	8.20	.11	.24	4.01	2.33	1.37	.67
1956	267.17	.43	7.65	7.69	7.74	.12	.23	4.22	2.17	1.34	.69
1957	266.02	.51	8.52	7.33	7.46	.13	.24	4.33	1.92	1.27	.72
1958	260.66	1.18	9.17	7.26	7.13	.16	.26	4.44	1.75	1.19	.76
1959	255.24	1.71	9.89	7.13	6.91	.23	.28	4.49	1.58	1.10	.82
1960	250.87	2.27	10.68	7.00	6.65	.26	.27	4.64	1.46	1.04	.90
1961	243.19	3.43	11.29	7.30	6.24	.28	.26	4.60	1.32	.97	.93
1962	240.85	4.70	11.63	7.52	6.49	.25	.28	4.39	1.23	.97	.98
1963	240.38	6.43	12.24	8.19	6.44	.28	.27	4.25	1.06	.92	1.01
1964	238.56	8.67	12.61	8.48	6.29	.29	.25	4.10	.94	.88	.93
1965	236.52	10.93	12.58	8.75	6.14	.32	.26	3.98	.86	.84	.95
1966	234.13	14.52	10.99	9.02	6.05	.37	.27	3.84	.75	.78	.98
1967	223.70	18.38	10.75	8.60	5.90	.47	.26	3.56	.65	.72	.94
1968	218.56	22.66	11.30	8.99	5.84	.63	.30	3.39	.52	.65	.96
1969	212.11	27.29	11.74	8.85	5.80	.85	.29	3.20	.46	.57	.96
1970	207.14	30.75	11.87	8.80	5.66	.86	.31	2.96	.38	.56	1.11
1971	199.88	35.88	11.55	9.21	5.66	1.16	.41	2.76	.33	.55	1.24
1972	196.07	40.32	12.71	9.75	5.63	1.38	.47	2.69	.28	.57	1.31
1973	187.50	44.35	14.23	9.87	5.19	1.53	.44	2.70	.39	.59	1.33
1974	176.68	46.81	14.22	9.97	4.86	1.64	.46	2.53	.40	.57	1.51
1975	175.16	55.52	12.00	10.08	4.89	2.11	.39	2.49	.42	.58	1.70
1976	167.77	59.37	12.02	11.12	4.87	2.27	.41	2.53	.36	.62	1.67
1977 1/	160.30	63.06	12.29	11.81	4.75	2.70	.45	2.52	.32	.59	1.75

1/ Preliminary.

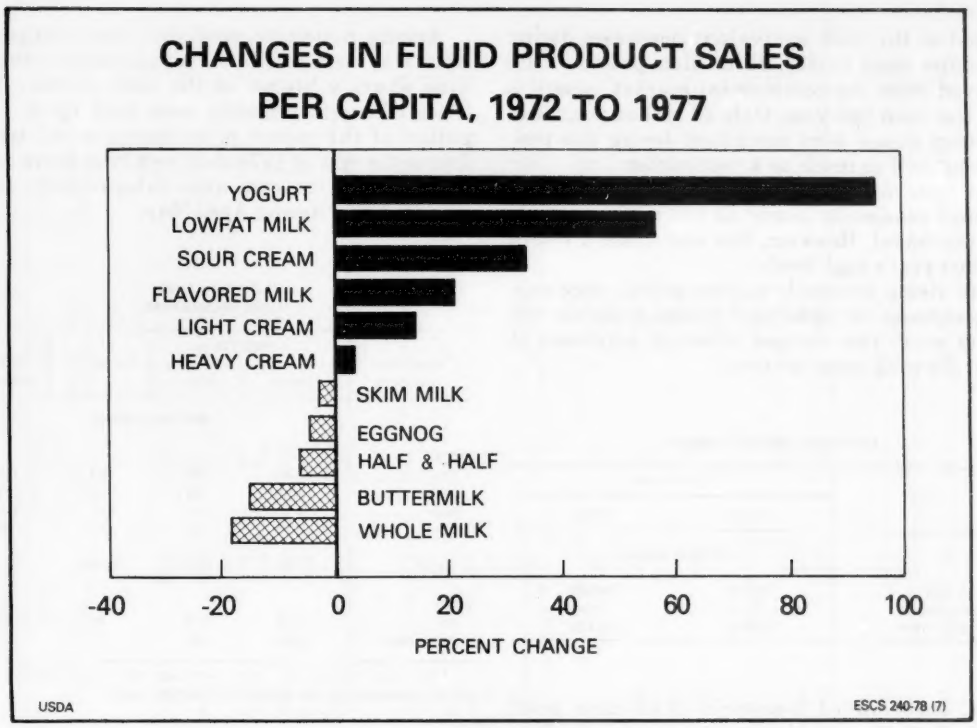


Figure 10

Dairy product stocks

Item	June 1 1976	June 1 1977	June 1 1978
	Million pounds		
Commercial:			
Butter	65.2	57.1	49.6
American cheese	375.5	466.7	369.0
Other cheese	60.2	67.0	69.7
Nonfat dry milk	103.0	119.4	86.8
Milkfat	203.3	227.6	189.0
Solids-not-fat	258.3	302.3	237.5
Milk equivalent	5,766	6,525	5,373
Government:			
Butter	4.3	106.7	211.8
American cheese	.5	23.6	37.4
Nonfat dry milk	366.7	419.1	600.9
Milkfat	3.6	93.5	182.5
Solids-not-fat	352.9	410.4	589.6
Milk equivalent	93	2,436	4,744

Manufacturers' stocks of nonfat dry milk on June 1 probably were fairly well in line with commercial needs, even though the 87 million pounds were more than a fourth less than last year and were the lowest on that date in 5 years.

Commercial stocks of milkfat on June 1 were down about a sixth from a year earlier, while industry holdings of milk solids-not-fat were down about 21 percent. On a milk equivalent basis, commercial stocks totaled about 5.4 billion pounds.

CCC Removals Lighter

The combination of weaker milk output and very strong sales led to smaller purchases under the price support program this spring. Net removals during May-June were equivalent to 1.3 billion pounds of milk (fat solids basis), down about a third from last year. This brought the first half total to 3.0 billion pounds milk equivalent, down more than a third from last year.

USDA dairy purchases[1]

Item	January-June		
	1977	1978	Change
	Million pounds		*Percent*
Butter	180.1	134.4	-25.4
American cheese	102.6	22.6	-78.0
Nonfat dry milk	226.8	196.9	-13.2
Evaporated milk	5.1	8.4	+64.7
Milk equivalent	4,744	3,001	-36.7

[1] Delivery basis.

Most of the milk equivalent purchases during May-June were butter; 55 million pounds were removed from the commercial market, almost a third less than last year. Only 20 million pounds of American cheese were purchased during this period, about half as much as a year earlier.

Net removals of nonfat dry milk in May-June remained seasonally heavy as 106 million pounds were purchased. However, this was down a fourth from last year's high levels.

With rising wholesale market prices, price support purchases of butter and cheese probably will be very small this summer although purchases of nonfat dry milk could continue.

Uncommitted CCC stocks

Item	June 30	
	1977	1978
	Million pounds	
Butter (bulk)	159.8	246.9
American cheese	52.4	55.4
Nonfat dry milk	524.3	597.5

CCC uncommitted inventories of all three products on June 30 were higher than a year ago. Butter inventories of 247 million pounds were up over 50 percent, while cheese inventories of 55 million pounds were only up 6 percent and do not present a disposal problem. Inventories of nonfat dry milk, at almost 600 million pounds, were 14 percent higher than a year ago but were below the levels of last fall and winter.

FOREIGN DAIRY TRADE AND TRENDS

Cheese Imports Expand Slightly

U.S. imports of all dairy products in April-May continued to run more than a tenth above a year earlier as cheese imports rose a fifth (table 8). Cheese imports in both quota and nonquota categories were well above a year ago, although the increase in imports of cheese under quota was more pronounced. Imported cheese apparently has also experienced the demand expansion noted for domestic cheese and imports may continue to run larger than last year. Although patterns varied by individual products, imports of high-fat products in April-May were similar to a year ago. Less nonfat dry milk but about the same amount of animal feeds with milk solids were imported.

Among nonquota products, casein imports in April-May were well below a year earlier, after running sharply higher in the first quarter. Inventories of casein probably were built up in anticipation of the recent price increases and imports during the rest of 1978 may well total below a year ago. Lactose imports were substantially larger than last year during April-May.

U.S. dairy trade (milk equivalent)

Year and quarters	Imports		Exports	Shipments[1]
	Cheese	Other		
	Million pounds			
1977				
1st	343	140	107	123
2nd	315	51	116	170
3rd	418	14	138	142
4th	624	61	99	92
Year[2]	1,701	267	459	527
1978				
1st	379	157	86	[3]168
April-May	229	22	69	[3]107

[1] To U.S. territories. [2] May not add due to rounding. [3] May not be completely comparable to earlier years.

Commercial exports in April-May were less than last year, as most dairy products were exported in smaller quantities. However, food aid exports of both nonfat dry milk and corn-soya-milk mixtures were larger than a year ago. Even though prices of dairy products in international markets have recovered slightly, the difference between U.S. prices and prices from Oceania or subsidized European prices remains quite wide and commercial exports of U.S. dairy products probably will remain small.

Shipments to U.S. Territories in April-May were also smaller than a year earlier. Increases in shipments of butter and dry whole milk were outweighed by declines in cheese and canned milk shipments.

EC Output Up; Intervention Stocks Down

Milk deliveries in the European Community (EC) were up about 3 percent from last year in early spring. With the May increase in intervention prices and currency realignment for agricultural products, milk output in the EC likely will continue to increase this year, further aggravating the serious surplus.

Butter and cheese output shared the early spring increase in milk production. However, cheese prices (which generally are not supported in the EC) have

Table 8--Dairy products: U.S. imports, quota and non-quota, total 1977, and January-May, 1977-78 1/

Product	Calendar Year quota	1977 imports	May			Cumulative, January-May		
			1977	1978	1978 as a % of 1977	1977	1978	1978 as a % of 1977
	Thou. lb.	Thou. lb.	Thou. lb.	Thou. lb.	Pct.	Thou. lb.	Thou. lb.	Pct.
Cheese, quota types								
American-Cheddar	10,037.5	9,337	47	1,546	**	2,579	4,245	165
-Other	6,096.6	6,407	---	---	---	662	857	129
Italian-Original loaves	11,500.1	9,803	591	661	112	4,607	3,691	80
-Other	1,494.0	1,343	54	62	115	498	532	107
Edam and Gouda-Natural	9,200.4	8,251	415	651	157	2,043	2,363	116
-Processed	3,151.0	1,064	10	33	330	201	100	50
Blue Mold	5,017.0	3,354	265	228	86	1,054	1,799	171
Swiss-Emmenthaler, -$1.10 *	20,420.0	14,133	703	556	79	3,633	3,123	86
-Gruyere-process, -$1.10 *	11,242.0	9,399	428	339	79	1,814	1,641	90
Other-Over 0.5% fat, -$1.10 *	40,730.0	38,308	896	491	55	3,955	3,887	98
-Under 0.5% fat	8,901.0	4,981	164	---	---	275	42	15
Total	127,789.6	106,381	3,573	4,567	128	21,322	22,281	104
Cheese, non-quota types								
Swiss-Emmenthaler, $1.10 + *		45,494	3,331	4,364	131	17,716	23,485	133
-Gruyere-process, $1.10 + *		5,881	256	520	203	1,990	2,572	129
Other, $1.10 + *		31,940	2,409	2,848	118	13,141	14,582	111
Pecorino		15,825	1,617	1,308	81	7,808	8,462	108
Roquefort		1,620	48	34	71	771	682	88
Other 2/		2,259	134	117	87	917	618	67
Total		103,018	7,794	9,191	118	42,344	50,401	119
Other quota products								
Butter	707.0	743	40	15	38	296	225	76
Butteroil	1,200.0	1,200	---	---	---	1,200	1,200	100
Butterfat mixtures	2,580.0	2,393	381	228	60	2,393	457	19
Ice cream	3,377.3	3,187	448	424	95	2,767	1,134	41
Frozen cream	12,540.0	12,529	187	339	181	7,316	10,297	141
Nonfat dry milk	1,807.0	1,825	99	100	101	839	859	102
Dried buttermilk	496.0	179	---	---	---	179	122	68
Evaporated milk	1,312.0	44	---	---	---	2	---	---
Condensed milk	4,079.0	767	---	---	---	346	431	125
Chocolate crumb-Regular	17,000.0	6,817	635	296	47	1,938	2,293	118
-Lowfat	4,680.0	2,425	40	200	500	80	320	400
Animal feed with milk solids	16,300.0	12,815	586	900	154	5,884	3,722	63
Non-quota products								
Casein		144,245	12,945	7,258	56	60,450	60,292	100
Lactose		3,991	221	338	153	744	1,733	233
Milk equivalent, fat solids basis total all products	1,305,620	1,967,758	102,861	126,515	123	702,463	787,427	112

1/ Preliminary. 2/ Gjetost, Bryndza, Gammelost and Noekkelost, and Goya.
*Price break effective May 1, 1978.
**More than 1,000.

Table 9--Dairy products: U.S. imports, 1968-77

Product	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977 1/
	Thousand pounds									
Cheese										
American-Cheddar	9,841	9,606	9,720	9,324	9,516	20,010	106,999	10,600	7,984	9,337
-Other	5,860	6,034	5,969	7,624	5,957	8,430	5,098	6,033	6,241	6,407
Total American	15,701	15,640	15,689	16,948	15,473	28,440	112,097	16,633	14,225	15,744
Italian-Original loaves	8,389	10,547	6,617	6,458	10,802	10,524	8,985	10,173	11,067	9,803
-Other	1,853	1,742	674	852	1,350	1,517	1,185	1,232	1,442	1,343
Total Italian	10,242	12,289	7,291	7,310	12,152	12,041	10,170	11,405	12,509	11,146
Edam and Gouda-Natural	8,626	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	8,524	8,251
-Processed	12,760	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	499	1,064
Total Edam and Gouda	21,386	11,457	11,799	10,127	10,146	11,596	9,373	9,207	9,023	9,315
Blue Mold	4,822	4,878	4,766	4,485	4,434	5,994	5,016	4,564	4,593	3,354
Swiss-Emmenthaler, "pricebreak" and over 2/	7,990	16,322	22,762	21,809	30,366	24,725	51,158	36,279	48,499	45,494
-Emmenthaler, under "pricebreak"	30,861	3,786	3,592	2,508	3,206	24,875	12,647	10,473	12,435	14,133
-Gruyere-process, "pricebreak" and over	5,724	9,401	10,800	8,937	9,882	5,703	9,018	5,322	6,741	5,881
-Gruyere-process, under "pricebreak"	14,253	3,248	3,149	2,662	2,904	9,936	6,285	6,829	8,690	9,399
Total Swiss	58,828	32,757	40,303	35,916	46,358	65,239	79,108	58,902	76,365	74,907
Other, "pricebreak" and over	7,820	12,701	22,631	18,812	31,820	21,241	35,853	26,155	34,405	31,940
Other, under "pricebreak"	31,291	23,541	23,371	14,849	23,680	52,477	35,478	25,832	31,116	38,308
Other, low-fat	268	8,932	10,752	7,025	8,397	11,965	8,616	6,667	4,741	4,981
Total Other	39,379	45,174	56,754	40,686	63,897	85,683	79,947	58,654	70,262	75,229
Pecorino	17,352	19,227	20,621	16,566	22,976	17,215	16,465	17,114	16,728	15,825
Roquefort	1,948	2,061	2,063	1,671	2,543	2,126	1,439	1,392	1,560	1,620
Gjetost	330	321	413	397	438	454	473	512	517	512
Bryndza	101	127	156	257	322	309	679	400	543	464
Gammelost and Noekkelost	335	182	256	473	748	698	716	628	627	503
Goya	---	---	761	1,039	3	6	41	18	325	781
Other products										
Butter	739	678	3/ 747	628	714	55,574	450	526	562	743
Butteroil	1,200	1,200	1,200	1,200	1,200	23,800	1,200	1,200	1,200	1,200
Butterfat mixtures	1,882	4/ 2,741	2,398	2,572	2,430	2,565	---	1,828	2,468	2,393
Frozen cream	12,607	14,748	11,062	11,235	12,600	12,540	12,406	12,353	12,964	12,529
Evaporated milk	4,908	1,313	1,236	1,299	94	1,209	1,214	455	28	44
Condensed milk	4,854	4,058	1,506	1,670	2,345	1,419	1,393	445	639	767
Chocolate crumb-Regular	45,337	18,603	15,260	12,803	9,652	5,624	5,859	2,323	9,246	6,817
-Lowfat	---	478	15,944	4,185	3,171	176	---	2,086	2,604	2,425
Total chocolate crumb	45,337	19,081	31,204	16,988	12,823	5,800	5,859	4,409	11,850	9,242
Ice cream	---	20,263	62,689	2,549	1,375	---	---	---	373	3,187
Dried products										
Whole milk	7	7	3	10	---	---	17	7	9	1
Malted milk	1	---	1	2	6	13	10	---	2	5
Buttermilk	536	174	421	355	594	270	137	783	444	179
Skim milk	1,747	1,914	1,759	2,136	1,602	266,564	115,065	2,465	1,807	1,825
Casein	116,100	116,107	135,288	105,939	105,401	112,828	112,889	58,444	112,141	144,245
Lactose	374	4,187	4,222	1,652	1,540	1,356	1,310	5,501	1,267	3,991
Animal feed 5/	---	9,965	27,297	11,812	10,356	15,793	9,009	15,795	12,226	12,815
	Million pounds									
Milk equivalent, fat solids basis, total all products	1,780	1,621	1,878	1,356	1,694	3,859	2,923	1,669	1,943	1,968

1/ Preliminary. 2/ Pricebreak of 47 cents changed to $.62 on June 3, 1972; to $.69 on March 15, 1973; to $.72 on August 29, 1973; to $.78 on April 1, 1974; to $.84 on January 16, 1975; to $.86 on April 9, 1975; to $.92 on October 16, 1975; to $.98 on April 14, 1976; to $1.00 on October 19, 1976; and $1.05 on May 5, 1977. 3/ Includes 40,400 pounds not subject to quota. 4/ Excludes 1.7 million pounds in retail packages reported by the Bureau of Customs. 5/ Containing milk products.

been under pressure from the expanded output and butter-powder production may absorb more of the increase in coming months. Early spring production of nonfat dry milk was just barely above a year ago.

Despite the expanded milk output, the EC has been successful in keeping intervention stocks below a year earlier by utilizing a variety of disposal methods. Although up sharply from March 1, intervention stocks of butter on July 1 were still down 3 percent from a year ago. Intervention stocks of nonfat dry milk were 12 percent smaller than last year and were less than two-thirds as large as 2 years earlier.

Elsewhere in Western Europe, early spring milk deliveries generally trailed year-earlier levels. Butter and nonfat dry milk output was generally lower but more cheese was produced than a year ago.

Canadian milk production this spring ran slightly ahead of a year ago, although well below 2 years earlier. Milk output in New Zealand and Australia is currently near their very pronounced seasonal low. Late autumn rains in New Zealand helped winter feed supplies but these supplies were still quite tight.

Overall, conditions in international dairy markets are in slightly better shape than they have been for a couple years. Policies to restrict milk output in some countries, modest price increases in the EC, accelerated efforts to dispose of surplus stocks, and increased import demand from the Mideast have all contributed. Despite the slight improvement, the problems of surpluses in most major producing countries and very low prices for products moving in international trade probably will persist for some time.

Table 10.--U.S. Dairy Situation at a Glance

Item	Unit or base period	1976	1977					1978		
		May	April	May	June	July	Year	April	May	June
Production and cow numbers:										
Total milk	Mil. lb.	11,110	10,743	11,373	11,021	10,695	122,957	10,686	11,219	10,928
Milk per cow	Lb.	1,006	976	1,035	1,004	975	11,194	982	1,052	1,007
Number of milk cows	Thou.	11,049	11,002	10,991	10,975	10,970	10,984	10,883	10,866	10,854
Prices received by farmers:										
All milk, sold to plants, 100 pounds	Dol.	9.25	9.44	9.37	9.40	9.49	9.72	10.10	10.00	10.00
Percentage of parity 1/	Pct.	80	74	75	78	78	75	74	80	76
Manufacturing grade milk, 100 pounds	Dol.	8.33	8.66	8.62	8.56	8.56	8.70	9.28	9.27	9.25
Parity equivalent	Dol.	10.08	11.01	11.01	11.01	11.01	10.93	11.98	12.07	12.16
Fat content	Pct.	3.58	3.62	3.56	3.52	3.50	3.66	3.65	3.59	3.55
Minnesota-Wisconsin (3.5% fat), 100 pounds	Dol.	8.30	8.60	8.62	8.60	8.65	8.58	9.24	9.25	9.26
Milk eligible for fluid market, 100 pounds	Dol.	9.49	9.65	9.56	9.61	9.72	9.96	10.30	10.20	10.20
Price ratios and dairy ration values:										
Milk-feed	Lb.	1.49	1.42	1.40	1.43	1.52	1.57	1.62	1.60	1.59
Manufacturing grade milk-hog	Lb.	.18	.21	.21	.20	.19	.22	.21	.19	.19
Manufacturing grade milk-beef cattle	Lb.	.22	.25	.24	.25	.25	.25	.20	.18	.18
Value of concentrate ration fed milk cows	Dol.	6.21	6.63	6.69	6.56	6.26	6.21	6.23	6.24	6.29
Farm cash receipts from dairy products	Mil. dol.	1,013	1,007	1,058	1,011	1,004	11,776	1,071	1,119	1,047
Production of factory product.:										
Butter	Mil. lb.	91.4	99.9	105.2	93.0	81.8	1,085.6	98.5	96.7	
American cheese, whole milk	Mil. lb.	206.6	194.4	212.0	201.3	175.2	2,042.4	190.8	208.2	
Cheese, other than American	Mil. lb.	107.6	110.2	114.0	114.6	104.9	1,315.5	115.4	120.5	
Canned milk, unskimmed	Mil. lb.	99.2	82.2	86.6	81.9	77.9	818.9	68.9	82.4	
Dry whole milk	Mil. lb.	9.1	6.3	7.5	6.3	4.3	69.4	7.4	8.0	
Frozen products 2/	Mil. gal.	105.1	98.0	106.1	125.2	118.9	1,147.4	95.2	108.2	
Creamed cottage cheese	Mil. lb.	76.4	75.7	78.4	77.3	74.5	877.6	75.5	81.1	
Total whole milk equivalent 3/	Mil. lb.	6,007	6,005	6,465	6,361	5,754	65,759	5,905	6,299	
Nonfat dry milk, human use	Mil. lb.	105.5	105.9	119.8	150.2	125.2	1,106.0	96.4	103.0	
Wholesale prices:										
Butter, Grade A, Chicago, pound	Ct.	89.9	100.1	100.7	100.7	100.7	98.4	105.2	106.7	106.7
Cheese, American (40-pound blocks), f.o.b. Wisconsin assembling points, pound	Ct.	94.9	97.9	97.9	97.4	97.1	96.8	102.6	102.6	102.6
Evaporated milk, case	Dol.	14.00	14.91	15.25	15.25	15.25	15.01	16.09	16.29	16.26
Dry whole milk, pound	Ct.	77.9	79.5	79.8	80.7	80.9	80.8	86.4	86.6	
Nonfat dry milk, pound	Ct.	62.7	65.6	67.9	68.1	68.0	66.5	70.5	71.1	
Dairy products and ice cream index (BLS)	1967=100	167.1	173.6	174.2	174.3	175.1	173.4	184.5	184.5	185.4
Retail prices (BLS):										
Milk, fresh, grocery, half-gallon	Ct.	82.0	83.4	83.5	83.9	83.4	83.9	86.7	87.2	
Evaporated milk, 14½-ounce can	Ct.	34.1	35.4	36.0	36.4	36.7	36.3	38.4	38.8	
Cheese, American, processed, sliced, 1-pound package	Ct.	85.7	84.8	85.7	86.0	86.2	86.0	92.8	93.6	
Butter, pound	Ct.	120.6	129.2	133.8	134.9	134.9	135.1	141.1	142.4	
Ice cream, half-gallon	Ct.	125.3	130.2	134.7	137.0	137.6	135.2	142.1	144.3	
Dairy products index	1967=100	167.4	171.4	173.1	174.3	174.1	173.9	181.4	182.8	
All foods index	1967=100	179.9	190.9	191.7	193.6	194.6	192.2	205.6	209.3	
Margarine, colored, pound	Ct.	51.6	53.9	56.1	58.1	59.6	57.2	60.9	62.4	
Stocks, end of month:										
Creamery butter	Mil. lb.	69.5	128.2	163.8	197.1	209.0	---	245.6	261.4	
Cheese, total 4/	Mil. lb.	436.1	510.4	557.3	587.4	603.5	---	458.2	470.1	
Canned milk, unskimmed	Mil. lb.	101.6	66.1	101.5	127.7	153.2	---	57.4	79.5	
Dry whole milk	Mil. lb.	10.6	10.0	8.6	9.9	9.0	---	7.3	8.4	
Total whole milk equivalent 5/	Mil. lb.	5,860	7,708	8,961	9,992	10,401	---	9,562	10,117	
Nonfat dry milk	Mil. lb.	469.7	522.0	538.5	580.8	613.2	---	686.5	687.7	
Commercial disappearance:										
Creamery butter	Mil. lb.	66.5	65.0	56.3	44.8	71.6	859.2	70.6	61.5	
Cheese, American	Mil. lb.	163.6	163.5	156.1	162.9	154.3	1,958.1	170.0	188.2	
Cheese, other than American	Mil. lb.	118.7	121.8	122.3	125.5	120.5	1,512.3	125.7	131.4	
Canned milk, unskimmed	Mil. lb.	60.7	77.9	49.9	55.2	70.2	799.2	61.8	59.2	
Milk in all products	Mil. lb.	9,957	9,581	9,625	9,451	10,150	116,386	9,770	10,113	
Nonfat dry milk	Mil. lb.	65.8	59.4	45.5	42.9	62.0	681.6	59.5	45.9	
USDA net removals:										
Butter	Mil. lb.	---	25.9	43.7	55.1	16.0	222.4	24.4	34.6	20.6
Cheddar cheese	Mil. lb.	1.1	6.6	14.0	25.1	16.8	148.3	1.8	6.0	15.6
Nonfat dry milk	Mil. lb.	16.0	37.3	62.8	78.2	67.8	464.3	27.6	51.5	54.0
Evaporated milk	Mil. lb.	1.7	1.0	1.6	.6	2.2	15.9	1.9	1.2	1.1
Total whole milk equivalent	Mil. lb.	15	602	1,043	954	501	6,092	509	777	562
Fluid sales, change from year earlier: 6/										
Whole milk	Pct.	-2.3	-4.3	-5.1	-1.7	-3.0	-3.5	-1.0	-2.5	
Low-fat and skim milk	Pct.	+7.1	+5.0	+7.7	+7.4	+6.4	+7.0	+8.5	+6.0	
Total fluid milk	Pct.	+.7	-1.0	+.4	+1.6	+.1	-.1	+2.4	+.6	
Cream and cream mixtures	Pct.	-3.2	-3.9	-1.9	-1.5	-7.0	+1.6	-10.2	N.A.	

1/ Seasonally adjusted price as percentage of parity price.
2/ Ice cream, ice milk, and sherbet.
3/ Includes manufactured products for which current monthly series are available.
4/ Natural, plus process American cheese held by CCC.
5/ Excludes cream and bulk condensed milk.
6/ Daily average sales in Federal and State Marketing areas.

CHANGING UTILIZATION OF MILK AND COMPONENTS OF MILK: IMPLICATIONS FOR THE FUTURE

By James J. Miller
Agricultural Economist
Economics, Statistics, and Cooperatives Service

ABSTRACT: Shifts in demand for various dairy products have substantially altered patterns of milk utilization. There has been much more milk used in cheese production, much less whole milk used for butter-powder output, and slightly more milk sold as fluid products. However, butter production has absorbed sharply increasing amounts of milkfat resulting from fluid standardization and cheese manufacture. Expected future changes in demand for dairy products will have further substantial impacts on industry structure, price determination, and the price support program.

KEYWORDS: Dairy, milk, demand, manufactured dairy products.

The demand for various fluid and manufactured dairy products is, in the long run, the predominant shaper of the ways milk and the components of milk are utilized and of most aspects of the U.S. dairy industry. Shifts in the demand for different dairy products have already resulted in substantial (although slow) changes in the industry. If the general direction of these changes continue, substantial further adjustment will be made, with significant implications for industry structure, the government price support program, total demand for milk in all products, and price determination and volatility.

Past Trends in Demand and Utilization

Fluid Milk

Total sales of fluid milk products (including cream and specialty items) have risen very slowly. Since 1960, the product weight of fluid items sold has risen about 15 percent, compared with an increase of about a fourth in the population using milk from purchased sources. The decline in per capita fluid sales of about a half percent per year has been primarily the result of the "baby boom" generation passing out of the peak milk consuming years and increased competition from other beverages.

Changes in the amount of milkfat sold in fluid forms have been much more dramatic. The average fat test of all fluid products in Federal Order markets fell to about 2.98 percent in 1977 from 3.76 in 1960. If this decline is representative of the country as a whole, per capita consumption of milkfat in fluid products has fallen about 30 percent.

The primary reason for the declining average fat test of fluid products has been the shift from whole milk to lowfat milks. In 1960, lowfat and skim milk sales were less than a tenth the size of whole milk sales; by 1977, lowfat and skim milk sales had increased to where they were almost half as large as the whole milk volume. This shift to lower-fat products resulted from both the much-publicized health considerations and their lower retail prices. In addition, the average fat test of whole milk items has declined as legal minimums have been reduced in many States and sales of half-and-half have fallen.

As larger amounts of cream have been removed from farm milk to reach the desired fat test as sold, the amount of farm milk needed to provide a given quantity of fluid sales has slowly increased. In

Milkfat released by fluid product sales

Year	Total fluid product sales	Farm milk needed to provide:[1]		Milkfat released (additional required)
		Milkfat	Skim milk	
	Million pounds			
1955	44,711	46,364	44,538	(69)
1960	49,027	49,289	49,000	(11)
1965	53,096	51,091	53,301	82
1970	54,312	48,244	54,925	245
1975	55,989	46,684	56,929	376
1977	55,902	45,644	56,932	412

[1] Calculated on the basis of removal (addition) of cream with 40% milkfat. No allowance for shrinkage was made.

1960, the amount of farm milk used was about equal to the product weight of fluid milk sold. (In fact, just slightly more farm milk was required to provide the cream in fluid products than was required to provide the skim milk component.) By 1977, about 102 pounds of farm milk was needed to yield 100 pounds of fluid milk (at average test sold), with about 2 pounds of cream (the equivalent of about a pound of butter) being released for use in manufactured products. Last year, about 412 million pounds of milkfat were released by standardization of fluid products. While some of this fat was absorbed in the production of perishable manufactured products, most of it was reflected in butter production.

Cheese

Growth in the demand for cheese has been both substantial and fairly constant. Since 1960, per capita cheese sales have about doubled. The average annual increase per person has been almost a half pound—about evenly split between American and other types. This growth in demand has resulted from rising consumer incomes and changes in lifestyles and eating habits.

Cheese has become by far the largest use of milk for manufacturing. In 1977, cheese production used about a fourth of the total market supply of milk, up from less than an eighth in 1960. The amount of milk used in cheese has expanded every year except 1962 and 1975 (table 11).

One result of increased cheese output has been larger amounts of cream going from the cheese industry into butter production. This cream results from both the separation of cream from whey and standardization of milk for some varieties. Between 1960 and 1976, the milk equivalent of butter from whey cream more than doubled, increasing its proportion of the total milk equivalent of butter from less than 4 percent to almost 12 percent.

Butter and Nonfat Dry Milk

The demand for butter has declined substantially for a long time. Per capita sales of butter have fallen at an annual average rate of almost a fifth of a pound since 1960, even though retail butter prices have risen more slowly than the averages for all dairy products, all foods, or all retail items. The dominant cause of the decline has been the continued wide differential between butter and margarine prices. The butter market is now dominated by away-from-home eating places, users of butter as an ingredient in other foods (primarily ice cream and relatively expensive products where butter has a substantial advertising appeal), and a shrinking number of "hard core" household butter users.

Commercial use of nonfat dry milk has dropped about a third since 1960, about the same as the drop for butter. The sharpest declines have been since the early 1970's as producers of processed foods have utilized substitutes (such as whey products) and as fluid processors have found that low-fat fluid milks without added nonfat solids have good consumer acceptance. However, the decline in nonfat dry milk use does not represent nearly as large a drop in powder demand as in butter demand since wholesale prices of nonfat dry milk have risen three times as rapidly as those of butter.

There has been a substantial shift in the relative value of milkfat and milk solids-not-fat. In 1960, over four-fifths of the value of manufacturing grade milk was associated with the milkfat content; this proportion was only about half by 1977. Although the relative values of milkfat and solids-not-fat are heavily influenced by the purchase prices under the government price support program, these support purchase prices have been adjusted over time to reflect changes in relative supply-demand conditions.

Although butter and nonfat dry milk have generally been viewed as joint products, butter output has always been proportionately larger than nonfat dry milk production. In earlier years, farm-separated cream was the primary source for this additional butter. However, this source diminished greatly during the 1950's, when marketing whole milk became much more profitable than selling cream and feeding the skim milk to animals. By the mid-1970's, the amount of farm-separated cream was insignificant.

Since the mid-1960's, cream from the fluid milk and cheese industries has become an increasingly important source of fat for butter. The amount of such residual cream from other products is primarily a function of sales of those products, and the price of butter has a limited, indirect impact on the supply of residual cream.

Table 11--Use of market supply of milk, United States, 1964-77

Year	Fluid use	Butter 1/	Cheese		Creamed cottage cheese	Evaporated and condensed milk 2/	Dry whole milk	Frozen dairy products, net	Other factory products	Total factory products 3/	Miscellaneous 4/	Market supply of milk 5/
			American	Other								
	Billion pounds (milk equivalent)											
1964	54.9	31.2	11.5	4.2	1.0	5.0	0.6	10.3	0.6	64.5	1.1	120.5
1965	55.4	28.5	11.5	4.3	1.0	4.6	.7	10.6	.6	61.8	1.2	118.4
1966	55.4	23.7	12.2	4.5	1.0	4.7	.7	10.5	.6	57.9	2.5	115.9
1967	54.0	26.1	12.7	4.5	1.0	4.0	.5	10.5	.3	59.8	1.2	114.9
1968	53.7	24.9	12.7	4.7	1.1	3.9	.6	11.0	.4	59.2	-.2	112.8
1969	52.8	23.7	12.7	4.9	1.2	3.9	.5	11.0	.4	58.3	1.0	112.1
1970	52.0	23.9	14.2	5.3	1.3	3.3	.5	11.0	.5	60.0	1.5	113.5
1971	51.9	23.9	15.1	5.8	1.3	3.2	.5	11.0	.7	61.6	1.5	115.0
1972	53.2	22.7	16.4	6.4	1.3	3.1	.6	11.0	.8	62.3	1.1	116.7
1973	52.4	18.6	16.8	6.8	1.1	2.9	.6	11.1	.7	58.7	1.9	113.0
1974	50.5	19.3	18.6	7.1	1.0	2.8	.5	11.2	.8	61.3	.7	112.5
1975	51.1	19.9	16.5	7.4	1.0	2.7	.5	11.9	.7	60.5	.8	112.4
1976	51.5	19.4	20.6	8.2	1.0	2.5	.6	11.6	.7	64.7	1.4	117.6
1977 6/	51.4	21.9	20.5	8.4	1.1	2.4	.5	11.5	.7	66.9	1.9	120.4
	Percentage of total market supply											
	Percent											
1964	45.6	25.9	9.5	3.5	.8	4.2	.5	8.5	.5	53.5	.9	100.0
1965	46.8	24.1	9.7	3.6	.8	3.9	.6	9.0	.5	52.2	1.0	100.0
1966	47.8	20.4	10.5	3.9	.9	4.1	.6	9.1	.5	50.0	2.2	100.0
1967	47.0	22.7	11.1	3.9	.9	3.5	.4	9.1	.3	52.0	1.0	100.0
1968	47.6	22.1	11.3	4.2	1.0	3.5	.5	9.8	.4	52.5	-.2	100.0
1969	47.1	21.1	11.3	4.4	1.1	3.5	.4	9.8	.4	52.0	.9	100.0
1970	45.8	21.1	12.5	4.7	1.1	2.9	.4	9.7	.4	52.9	1.3	100.0
1971	45.1	20.8	13.1	5.0	1.1	2.8	.4	9.6	.6	53.6	1.3	100.0
1972	45.6	19.5	14.1	5.5	1.1	2.7	.5	9.4	.7	53.4	.9	100.0
1973	46.4	16.5	14.9	6.0	1.0	2.6	.5	9.8	.6	51.9	1.7	100.0
1974	44.9	17.2	16.5	6.3	.9	2.5	.4	10.0	.7	54.5	.6	100.0
1975	45.5	17.7	14.7	6.6	.9	2.4	.4	10.6	.6	53.8	.7	100.0
1976	43.8	16.5	17.5	7.0	.9	2.1	.5	9.9	.6	55.0	1.2	100.0
1977 6/	42.7	18.2	17.0	7.0	.9	2.0	.4	9.6	.6	55.6	1.6	100.0

1/ Excludes milk equivalent of whey cream, includes milk equivalent of residual cream from fluid and other uses.
2/ Canned and bulk.
3/ May not add due to rounding.
4/ Minor miscellaneous uses and any inaccuracies of independently determined use items.
5/ Milk marketed by farmers, net imports of ingredients such as frozen cream, butterfat-sugar mixtures and "ice cream", and net change in storage cream.
6/ Preliminary.

The proportion of total butter output that was equivalent to nonfat dry milk (including dry skim for animal feed) rose sharply to a peak of about 85 percent during the mid-1960's. Since then, the increases in the amount of cream from other dairy products have far outweighed the declines in farm-separated cream. In recent years, the amount of butter equivalent to nonfat dry milk production was only about half of the total butter output (table 12).

The amount of milk used for butter-powder production has been rather variable, reflecting changes in the overall supply-demand conditions for milk as well as market conditions for these two products. The industry has favored butter and nonfat dry milk sales to CCC as the way to remove surpluses, because the surplus could be handled by delaying the exodus of existing butter-powder capacity instead of building additional new American cheese capacity and because costs of intermittent production were somewhat lower.

Generally, butter-powder production has utilized decreasing shares of the milk supply. Although market supplies of milk were about the same in 1965 and 1976, output of nonfat dry milk fell by more than a half and used only about a tenth of the 1976 supply of solids-not-fat. Meanwhile, butter production fell only about a fourth and still used almost a fifth of the 1976 market supply of milkfat. Both the amount of milk and the proportion of the total supply used in joint production of butter and nonfat dry milk rose considerably in 1977, but this resulted from the need to remove a large surplus and did not reflect longer run trends.

Other products

The amount of milk utilized in other manufactured dairy products has remained fairly stable since 1960. Increased sales of frozen desserts and cottage cheese have about offset declines in canned milk use. In total, these products have used about 15 percent of the market supply of milk.

Implications for the Future

Cheese

The basic factors which have boosted demand for cheese are expected to continue. If accompanied with moderate growth in consumer purchasing power, basic changes in preferences probably will increase sales of cheese. However, these gains may well start to slow as the market matures, at least in percentage terms.

Increases in cheese sales would mean that cheese output will require a growing proportion of the total supply of whole milk available for manufacturing. This, in turn, will mean that the value of milk for manufacturing will become even more sensitive to supply-demand conditions in the cheese market. In the past, market conditions for butter or nonfat dry milk could more easily buffer the impacts on milk prices from changes in the cheese market.

The expected expansion in cheese production would increase the amount of whey cream and cream from the standardization of milk for cheese. This will increase the amount of butter produced without the associated skim milk to be dried.

The growth in whey product output could be quite large. In addition to the increase in the amount of liquid whey produced by the growing cheese output, the proportion of liquid whey utilized in whey products probably will rise. Methods of disposal other than use in whey products are much less feasible for large cheese plants, and the proportion of total cheese output from such large plants is expected to continue to grow. In recent years, less than 60 percent of the total liquid whey was used in whey products. Even though demand for dry whey has increased sharply in recent years, large increases in supply generally have kept prices at unprofitable levels (although drying has often been the least-cost method of disposal). While this pattern may persist for several years, whey products may become profitable byproducts in the future.

Fluid Milk

The demand for fluid milk products probably will remain fairly stable. Even with the offspring of the "baby boom" generation starting to enter the peak milk-consuming years, competition from other beverages probably will result in slower growth in fluid milk sales than the increase in population.

Even though the impact of the controversy relating to the role of saturated fats in the U.S. diet may be receding, the desire to restrict caloric intake probably will continue to favor shifts from whole milk to lowfat and skim milks. These shifts will continue to lower the average fat content of fluid products. The declines in fat test probably will start to slow however, partially because most States have now adopted the Federal minimum of 3.25 percent fat for whole milk and the average for Federal Order markets is now close to that level.

The combination of more product pounds of fluid milk sold and a substantially lower amount of milkfat sold in those products will lead to much larger amounts of cream released from the fluid market. Unless ice cream sales unexpectedly spurt, the additional cream will be churned for butter.

Butter

The demand for butter may well continue to decline as the number of "hard core" consumers

Table 12--Butter production, total and by source of milkfat, and nonfat dry milk production, selected years, 1950-77

Year	Butter production							Nonfat dry milk production		
	Total	By source of milkfat						Edible	Animal	Total
		Whole milk 1/		Whey cream 2/		Other cream				
	Mil. lb.	Mil. lb.	Pct.	Mil. lb.	Pct.	Mil. lb.	Pct.	--- Mil. lb. ---		
1950	1,386	499	36	41	3	846	61	882	17	899
1955	1,383	770	56	45	3	567	41	1,366	20	1,386
1960	1,373	1,025	75	50	4	299	22	1,819	26	1,844
1965	1,325	1,118	84	58	4	148	11	1,988	25	2,013
1966	1,112	892	80	63	6	157	14	1,580	26	1,606
1967	1,225	949	78	65	5	211	17	1,679	30	1,709
1968	1,165	901	77	65	6	199	17	1,594	27	1,621
1969	1,118	815	73	67	6	236	21	1,452	14	1,467
1970	1,137	809	71	74	6	254	22	1,444	12	1,456
1971	1,144	794	69	81	7	269	24	1,418	11	1,429
1972	1,102	687	62	88	8	327	30	1,224	13	1,236
1973	919	515	56	91	10	313	34	917	10	926
1974	962	570	59	100	10	292	30	1,020	6	1,026
1975	984	561	57	95	10	328	33	1,002	8	1,009
1976	979	518	53	113	12	347	36	926	6	932
1977	1,086	619	57	113	10	354	33	1,106	8	1,114

1/ Estimated from nonfat dry milk production (1.8 pounds of nonfat dry milk per pound of butter).
2/ Estimated from milk equivalent of whey cream butter.

shrinks further. The decline in butter demand probably will be slower since household use represents a much smaller proportion of the total use than formerly and institutional and ingredient use likely will be fairly stable.

With a shrinking demand for butter and an increasing amount of butter produced from cream released from other dairy products, the price of butter relative to most other dairy products will continue to decline. The quantity of butter produced may eventually be determined primarily by factors other than the price of butter and the butter price will reflect the level necessary to clear this relatively fixed supply. Relatively lower butter prices probably will keep declines in per person butter use much smaller than in the past, even if butter demand continues to shrink. (The experience of late 1974 and 1975 showed that consumers will shift from margarine to butter when retail prices are relatively close.) The impacts on butter prices may also slow the declines in the average fat test of fluid products, since the retail price differentials between whole, lowfat, and skim products may tend to narrow.

An additional impact of most of the butter output coming from residual cream will be a continued shift in the seasonal pattern of butter production. When most of the butter came from whole milk or farm-separated cream, butter output peaked in May—close to the seasonal peak in milk output. However, the amount of butter churned from cream released from fluid products is highest in early winter—when farm fat tests are high, fluid sales are fairly high, and ice cream sales are low. This pattern has been reflected in recent years when the yearend peak in butter production has been about as high or higher than the spring peak. In the future, butter output in December and January probably will be considerably larger than the May level.

Nonfat Dry Milk

Since supply-demand conditions for skim milk are expected to be considerably tighter than for milkfat, the demand for nonfat dry milk will be the primary determinant of the amount of whole milk going into butter-powder operations. Nonfat dry milk demand probably will continue to shrink as whey products and other substitutes make further inroads on nonfat dry milk usage in processed foods. This substitution has already been largely completed in bakery use. With the shifting of the value of milk to the skim milk component, nonfat dry milk use could continue to shrink substantially until only much smaller amounts are required. Such usage would be limited to direct consumer use and use in products (such as other dairy products) where substitutes cannot be used due to technical or legal restriction. Even this market may shrink over time as the retail price differential between nonfat dry milk and fluid skim milk shrinks (in percentage terms) and technical problems are overcome.

The amount of whole milk going into butter-powder output probably will diminish greatly. With a much smaller proportion of milk supplies for manufacturing, the impact on farm milk prices of market conditions for butter and nonfat dry milk would be much less and most of the remaining impact would come from powder rather than from butter.

Total Demand for Milk

Under these conditions, the total demand for milk would be determined by the demand for products which utilize the skim milk component, especially fluid milk and cheese. The demand for skim milk in all fluid products would increase slowly and the growth in cheese sales would outweigh the decline in skim milk used in nonfat dry milk production. The total demand for milk would increase slowly, although the rate of increase may not substantially exceed the rate of population growth. With this growth in demand, the market value of milk (relative to the price of other goods in the economy) will be heavily influenced by the rate of technological and management gains in milk production and processing and the prices of input items.

Since the change in total demand for milk in future years will be heavily influenced by changes in cheese sales, the potential impact of cheese analogs is great. If these analogs capture a significant portion of the market for cheese, then the total demand for milk and its market price would be significantly lower. Filled cheese sales, on the other hand, would not have a substantial impact on the total demand for milk or milk prices since filled cheese uses skim milk. However, they would have a significant impact on butter prices.

Impacts on Industry Structure

These shifts in the utilization of milk will have a substantial impact on the structure of dairy manufacturing. In those areas where manufactured products utilize a large proportion of total milk output, there will be a continued shift from butter-powder capacity to cheese capacity. There probably will be a gradual exodus of butter-powder capacity from the West North Central region and, possibly, California.

In those areas with high fluid utilization, conditions may be somewhat different. Butter-powder plants have been preferred as a means of balancing the variation in the amount of milk to be

manufactured. This has been due to the relative ease of intermittent marketing of butter and nonfat dry milk and the somewhat lower costs of starting and stopping production. As cheese demand grows and nonfat dry milk demand shrinks, these operations will become less viable as a means of balancing the fluid market. Capacity to produce nonfat dry milk in those areas will diminish. However, with increasing amounts of cream coming from fluid products, churning capacity may remain or even increase in those areas. The location of butter capacity will depend on the relationship between the efficiencies of concentrated production (both in economies of size and the lesser degree of variation of cream supply) and the costs of transporting cream to centralized locations.

Impacts on the Price Support Program

With the value of milk for manufacturing becoming more closely tied to cheese prices, the ability of the government to support milk prices will become more dependent on the ease of removing surplus milk in the form of cheese. As butter-powder capacity contracts, it will be increasingly difficult for these operations to absorb substantial quantities of surplus milk. Some evidence of this was seen in the failure of milk prices to reach support level in 1977. Last year, problems in clearing enough cheese to USDA greatly contributed to lower milk prices; in earlier years, enough milk could have been shifted into butter and nonfat dry milk to avoid a price-depressing effect.

Eventually it may be possible to support milk prices solely by means of cheese purchases. However, this probably would not be desirable from the standpoint of utilization of CCC supplies. In order to fully utilize available donation outlets, CCC purchase prices for butter and nonfat dry milk may have to be high enough to encourage the industry to maintain some standby butter-powder capacity.

Summary

Shifts in demand for different dairy products will continue to change the pattern of use of milk and the components of milk. In general, the direction of these shifts probably will be similar to the past. The importance of cheese manufacture likely will grow, the importance of joint butter-powder production will diminish, and the proportion sold as fluid products may be about the same. Over time, industry structure, the price support program, and prices of milk and individual dairy products probably will continue to reflect these changes.

For additional information on topics discussed in this article see the following tables and accompanying text:

Dairy Situation, DS-371, July 1978, Table 3, p. 13, and Tables 5-7, pp. 16-18.

Dairy Situation, DS-370, May 1978, Table 2, p. 8.

Dairy Situation, DS-367, September 1977, Tables 6-9, pp. 17-20.

UNITED STATES DEPARTMENT OF AGRICULTURE
WASHINGTON, D.C. 20250

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

NOTICE: If you don't want future issues of this ESCS publication, check here ☐ and mail this sheet to the address below.

If your address should be changed, write your new address on this sheet and mail it to:

Automated Mailing List Section
Office of Plant and Operations
U.S. Department of Agriculture
Washington, D.C. 20250

DS-371 JULY 1978

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF
AGRICULTURE
AGR 101
FIRST CLASS

U.S.MAIL

8258 KOSLMR300A112 18009 0001
M KOSLOWSKI C SA SPD UNIV M-
ICROFILMS INTER
300 N ZEEB RD
ANN ARBOR MI 48106

LIST OF TABLES

Table	Title	Page
1	Commercial disappearance: Total milk, annual and by quarters, 1976-78	11
2	Commercial disappearance: Selected dairy products, United States, annual 1969-77, by quarters, 1977-78	12
3	Milk and dairy product sales (domestic disappearance, commercial sources) total and per capita, selected years, United States, 1970-77	13
4	Sales of individual fluid products as a proportion of average daily fluid milk sales, all Federal order markets, 1965, 1970, and 1974-77	15
5	Sales of individual beverage milk products, United States, 1954-77	16
6	Sales of individual cream and specialty products, United States, 1954-77	17
7	Per capita sales of selected fluid milk items, 1954-77	18
8	Dairy products: U.S. imports, quota and non-quota, total 1977, and January-May, 1977-78	21
9	Dairy products: U.S. imports, 1968-77	22
10	U.S. dairy situation at a glance	24
11	Use of market supply of milk, United States, 1964-77	27
12	Butter production, total and by source of milkfat, and nonfat dry milk production, selected years, 1950-77	29